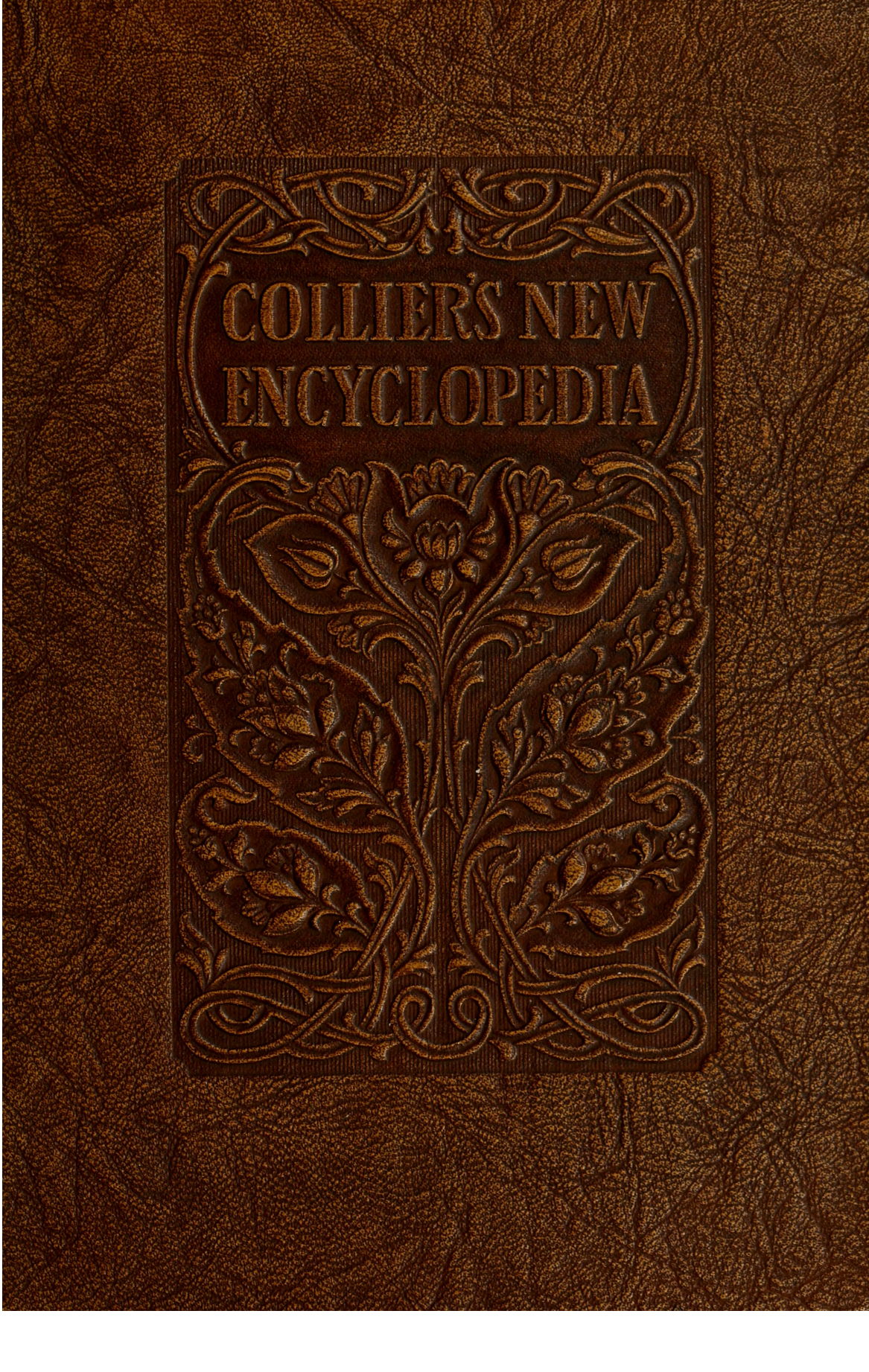

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CONSTANTINOPLE

Constantinople with the Bosporus in the background. The view shows the three chief mosques of the city. The largest is Agia Sofia, formerly the Church of St. Sophia, which was begun in 532 A. D. by the Emperor Justinian. The city occupies a most important strategic position at the meeting of two continents, Europe and Asia.

Europe and Asia.

occasion a sanguinary instrument adapted to destroy at a single operation two of human species.

St. Stephen was judged guilty of blasphemy in 325 A. D. by the Emperor Justinian. The city of Constantinople was the first Episcopal see in Europe. The Church of Christ was founded in A.D. 30. The Church of Rome was founded by St. Peter. The city of Jerusalem is 2,520 miles from London.

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"CIRCUM—ELKHART"

CIRCUMNAVIGATOR, one who sails round the globe. The first European known to have circumnavigated the globe was Magellan or Magalhaens, a Portuguese, who accomplished the feat in A. D. 1519. From him the Strait of Magellan derives its name.

CIRCUS, among the Romans, a nearly oblong building without a roof, in which public chariot-races and exhibitions of pugilism and wrestling, etc., took place. It was rectangular, except that one short side formed a half-circle; and on both sides, and on the semicircular end, were the seats of the spectators, rising gradually one above another, like steps. On the outside the circus was surrounded with colonnades, galleries, shops, and public places. The largest of these buildings in Rome was the Circus Maximus, capable, according to Pliny, of containing 260,000, and according to Aurelius Victor 385,000 spectators. At present, however, but few vestiges of it remain, and the circus of Caracalla is in the best preservation. The games celebrated in these structures were known collectively by the name of *ludi circenses*, circensian games, or games of the circus, which under the emperors attained the greatest magnificence.

The modern circus is a place where horses and other animals are trained to perform tricks, and where exhibitons of acrobats and various pageantries, including a large amount of buffoonery, are presented.

CIRRHOSIS, a chronic nonsuppurative inflammation affecting the interstitial connection or supporting tissues of an organ. The process begins after a more or less hyperæmia of the parts in a growth of new connective tissue which is fibrous in character. This subsequently contracts, and in so doing interferes with the nutrition of the proper physiological tissue of the organ, causes it to atrophy or degenerate, and finally takes its place. The term was originally applied to the LIVER (*q. v.*).

CIRRUS (plural, Cirri), the tendril of a plant by means of which it climbs, usually a modified leaf or the prolongation of a midrib.

CIRRUS. See CLOUD.

CIRTA, the capital of the ancient Massylii in Numidia. After the defeat of Jugurtha it passed into the hands of the Romans, and was restored by Constantine, who gave it his own name. See CONSTANTINE.

CISALPINE REPUBLIC, a former state in north Italy. After the battle of Lodi, in May, 1796, General Bonaparte proceeded to organize two states—one on the S. of the Po, the Cispadane Republic, and one on the N., the Transpadane. These two were on July 9, 1797, united into one under the title of the Cisalpine Republic, which embraced Lombardy, Mantua, Bergamo, Brescia, Cremona, Verona, and Rovigo, the duchy of Modena, the principalities of Massa and Cararra, and the three legations of Bologna, Ferrara, and the Romagna. The republic had a territory of more than 16,000 square miles, and a population of 3,500,000. Milan was the seat of the government or Directory. The army consisted of 20,000 French troops, paid by the republic. The republic was dissolved for a time in 1799 by the victories of the Russians and Austrians, but was restored by Bonaparte after the victory of Marengo, with some modifications of constitution and increase of territory. In 1802 it took the name of the Italian Republic, and chose Bonaparte for its president. A deputation from the republic in 1805 conferred on the Emperor Napoleon the title of King of Italy; after which it formed the kingdom of Italy till 1814.

CISCO, a city of Texas, in Eastland co., on the Texas and Pacific and the Texas Central railroads. It is the distributing center for a large territory. Its business is drawn largely from the oil industry. In 1920 a large dam to provide for the city's water supply was begun. It is the center of an important agricultural region and in the neighborhood are important clay and coal deposits. It has newspapers, electric lights, natural gas, hotels, banks, etc. Pop. (1910) 2,410; (1920) 7,422.

CISLEITHANIA, or **CISLEITHAN PROVINCES**, formerly Austria proper or Austria W. of the river Leitha, which partly forms the boundary between it and Hungary.

CIST, a place of interment of an early or prehistoric period, consisting of a rectangular stone chest or inclosure formed of rows of stones set upright, and covered by similar flat stones. Such cists are found in barrows or mounds, inclosing bones. In rocky districts cists were sometimes hewn in the rock itself.

CISTERCIAN, a monastic order in connection with the Roman Catholic Church. In the year 1098, Robert, Abbot of Molesme, in Burgundy, having lost hope of inducing the monks, whose chief he was, to live up to the rule prescribed by St. Benedict, retired with 20 associates to Citeaux and founded there a congregation which afterward developed into the order of the Cistercians. It went

through the ordinary cycle of such monastic institutions, *i. e.*, at first its members were poor and really holy; then the fame of their sanctity, spreading through Europe, branches of the order were established in many places. To aid men so deserving, large contributions were given by pious men and women, and before the 12th century had run its course, the Cistercian communities were wealthy. With the growth of this wealth, the gradual relaxation of the strict Benedictine rules took place, till finally the Cistercians lost their high reputation and sank to the level of the order against which their secession had been a protest, and to that of the monastic orders generally. During the time that the order was rising in importance, it enjoyed the advocacy of the celebrated St. Bernard of Clairvaux, who is regarded as its second parent and founder, so that it is sometimes called the Bernardine order, or the order of St. Bernard. Between them and the Cluniacensians there was considerable animosity, and even public controversy. The majority of Cistercian houses have ceased to exist. There are still a few in Italy, Switzerland, Belgium, and Austria, two in Ireland, and one in England.

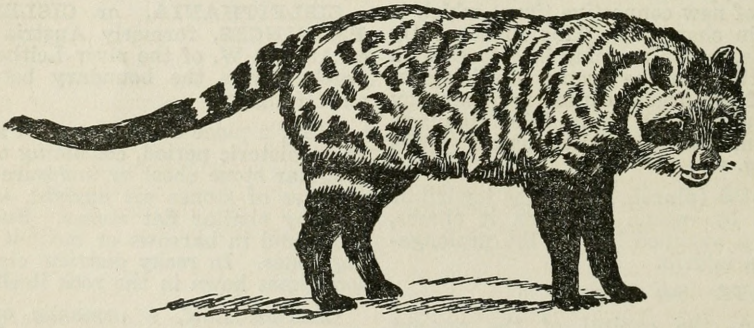
CITIES OF THE PLAIN, Sodom and Gomorrah, chief of those five cities which, according to the commonly received account, were destroyed by fire from heaven, and their sites overwhelmed by the waters of the Dead Sea.

CITRIC ACID ($C_6H_8O_7$), the acid of lemons, limes, and other fruits. It is generally prepared from lemon-juice, and when pure is white, inodorous, and extremely sharp in its taste. In combination with metals it forms crystalline salts known as citrates. The acid is used as a discharge in calico-printing and as a substitute for lemon in making beverages.

CITRON, the fruit of the citron-tree, resembling a lemon, but less acid in taste. It is a native of Asia. The tree has short and stiff branches, oblong-toothed leaves, flowers purple externally, and fruit generally large, warted, and furrowed, having a protuberance at the apex, with a very thick, spongy adherent rind and a subacid pulp. The Romans brought it from Media, where, however, it is not now, if it ever was, indigenous. It is at present cultivated in gardens in the warmer parts of both hemispheres. It furnishes oil of citron and oil of cedra.

CITRUS, a genus of *Aurantiaceæ*, trees and shrubs of tropical, subtropical, and warm temperate Asia, but many of them now cultivated in all similar climates for their fruit. To it belong the orange, citron, lemon, lime, bergamot, shaddock, forbidden fruit, etc.

CITY (Latin, *civitas*), in a general sense, a town holding, from extent of population, favorable situation, or other causes, a leading place in the community in which it is situated. Popularly, also, it is used, both in Great Britain and France, to designate the old and central nucleus as distinguished from the suburban growths of large towns. The ecclesiastical sense of the term city is a town which is, or has been, the see of a bishop. This seems to be the historical use of the term in England, and still possesses some authority there, but to a considerable extent it has been superseded by the wider one. In the United States the application of the term is dependent upon the nature and extent of the municipal privileges possessed by corporations, and a town is raised to the dignity of a city by special charter. See MUNICIPAL GOVERNMENT.



CIVET CAT

CIUDAD (thē-ō-dad′), the Spanish word for city, appearing in many names of Spanish Latin-American places.

CIVET, in zoölogy, the same as Civet-cat; found in north Africa; climbs trees with facility. Its food consists of small mammals, reptiles, and birds, as well as

roots and fruits. It is sometimes kept in the region which it inhabits for the sake of the perfume which it furnishes. There is an allied species, *V. rasse*, in Java.

CIVIC ASSOCIATION, AMERICAN, an organization established in 1904 for the general purpose of cultivating higher ideals of civic life and to promote city, town, and neighborhood improvement. It has for an additional purpose the preservation and development of landscapes and the advancement of outdoor art. The work of the association is conducted on national lines by its varied activities for the physical improvement of the various communities. It has devoted special attention to city planning and the creation and maintenance of parks, the elimination of smoke, billboards, and other nuisances, and the organization of citizens into working groups for civic improvement. The association did valuable work in the preservation of the scenic beauty of Niagara Falls. It also took a prominent part in the movement for the protection of the national parks. Its headquarters are in Washington.

CIVICS, the science that treats of citizenship and the relations between citizens and the government. It embraces ethics, or social duties; civil law, or governmental methods; economics, or the principles of finance and exchange; and the history of civic development. The study of this science has been largely introduced into the schools of the United States.

CIVIL ENGINEERING, the science or art of constructing machinery for manufacturing purposes, constructions and excavations, for general transit, as canals, docks, railroads, etc. It is so called in contradistinction to military engineering, which is confined to war.

CIVILIZATION, a condition consisting in what may be broadly called culture in a nation; and a nation may be considered as civilized when a large proportion of those belonging to it have their intellectual and moral faculties and all their higher nature in large measure developed and becoming increasingly so with the advance of years. Before this can take place, a considerable amount of material prosperity must have been achieved, between which and the culture already described there are continual action and reaction.

Regarding progression in material prosperity, certain stages tend to occur: (1) a barbarous one, in which one feeds on roots, fruits, and fishes, when these last can be caught without effort; (2) the state of a hunter; (3) that of the shepherd, in which, to avoid the uncertainty of the result in hunting, wild animals are domesticated; (4) the agricultural state, and (5) that of manufactures and commerce. Regarding mental advance it has been maintained that nations necessarily passed through a theological, a metaphysical, and a positive or scientific stage.

CIVIL LAW, the law of a state, city, or country; appropriately the Roman law comprised in the Institutes, Code, and Digest of Justinian, and the Novel Constitutions.

CIVIL LIST, the annual allowance voted to the members of the reigning family in constitutional monarchies in which Parliament possesses control of the finances of the country.

CIVIL SERVICE, that branch of the public service which includes the non-military servants of the government.

The purpose of the civil-service act, as declared in its title, is to regulate and improve the civil service of the United States." It provides for the appointment of three commissioners, not more than two of whom shall be adherents of the same political party, and makes it the duty of the commission to aid the President, as he may request, in preparing suitable rules for carrying the act into effect. The act requires that the rules shall provide, among other things, for open competitive examinations for testing the fitness of applicants for the classified service, the making appointments from among those passing with highest grades, an apportionment of appointments in the departments at Washington among the States and Territories, a period of probation before absolute appointment, and the prohibition of the use of official authority to coerce the political action of any person or body. The act also provides for investigations touching the enforcement of the rules, and forbids, under penalty of fine or imprisonment, or both, the solicitation by any person in the service of the United States of contributions to be used for political purposes from persons in such service, or the collection of such contributions by any person in a government building.

The commission was organized on March 9, 1883. The first classification of the service applied to the departments at Washington and to postoffice and custom houses having as many as 50 employees, embracing 13,294 employees. The commission then consisted of three commissioners, the chief examiner, secretary, stenographer, and messenger boy. On June 30, 1917, there were 517,805 officers and employees in the executive civil service, of which 326,899 held posi-

tions subject to competitive examination under the civil service rules. On June 30, 1920, the total number of employees was approximately 640,000. Examinations are held in the principal cities throughout the country through the agency of local boards of examiners, of which there are approximately 3,000. The members of these boards are detailed from other branches of the service. During the fiscal year ended June 30, 1919, the commission examined 438,259 persons, and of this number 179,533 were appointed. The present force of the commission consists of 287 clerks and examiners and 37 sub-clerical employees at Washington, and 12 district secretaries and 29 clerks and examiners in the field service. The expenditure for salaries in the Executive Civil Service is over $200,000,000 a year.

The commission also holds examinations in Hawaii, Porto Rico, and the Philippine Islands. Under the rules, it is required to render all practicable assistance to the Philippine Civil Service Board.

Appointments of unskilled laborers in the departments at Washington and in the large cities are required to be made in accordance with regulations promulgated by the President, restricting appointments to applicants who are rated highest in physical condition. This system is outside the civil service act, and is auxiliary to the civil service rules.

Similar provisions have been made in most of the States and their political subdivisions.

CIVIL SERVICE REFORM LEAGUE, an organization founded in 1881, for the purpose of investigating the efficiency of governmental civil service. It has performed effective work in this connection and largely through its influence many important civil service measures have been passed. During the World War its work was especially valuable in securing civil service efficiency as a factor in military success. After the signing of the armistice in November, 1918, the League effected an investigation into the sources of inefficiency in the civil service at Washington, and recommended the reorganization of the Civil Service Commission.

CIVIL WAR, AMERICAN, a war in the United States, caused by the attempt of the Southern States to establish an independent government under the name of the Confederate States of America. The first gun was fired, on Jan. 9, 1861, by batteries in Charleston harbor, which drove back the steamer "Star of the West," bearing supplies to Fort Sumter. The actual outbreak of war, however, is dated from April 12, when Fort Sumter was bombarded. The first blood was shed in Baltimore on April 19 in a street attack on the Sixth Massachusetts regiment, which was on its way to Washington. Bull Run (July 21, 1861) was the first great battle. It resulted in a severe defeat for the Union army; its effect was to encourage the South and raise a determined spirit in the North, and to unify both sections in support of their respective policies. The Mississippi was opened to Union vessels by the capture of New Orleans in April, 1862, and of Vicksburg and Port Hudson in July, 1863. The latter month also saw the Union victory of Gettysburg, by which the Confederate attempt to carry the war into the Northern States was overthrown. From July, 1863, the final victory of the National cause was assured. Sherman's march to the sea in the latter part of 1864, cut through the heart of the Confederacy and did incalculable damage to the Southern cause. The vigorous blows which, in 1864 and the spring of 1865, Grant dealt to Lee's army in Virginia, brought the war to a conclusion. Lee surrendered at Appomattox Court House on April 9, 1865. Johnston's army surrendered on April 26, and within two months more all the Confederate forces had laid down their arms.

The result of the war was to establish the fact that the United States is a nation and not a league of States, and that no State has the right to secede from the Union. It also resulted in the abolition of slavery. The proclamation of emancipation, issued by President Lincoln on Jan. 1, 1863, declared the freedom of all slaves within certain designated territory which was in rebellion, and the Thirteenth Amendment to the Constitution, adopted after the war, extinguished slavery in the United States. During the Civil War there were 2,778,304 men mustered into service on the Union side and about 600,000 on the Confederate. The number of casualties in the volunteer and regular armies of the United States during the war, according to a statement prepared by the Adjutant-General's office, was as follows: Killed in battle, 67,058; died of wounds, 43,012; died of disease, 199,720; other causes, such as accidents, murder, Confederate prisons, etc., 40,154; total died, 349,944; total deserted, 199,105. Number of soldiers in the Confederate service who died of wounds or disease (partial statement), 133,821. Deserted (partial statement), 104,428. Number of United States troops captured during the war, 212,608; Confederate troops captured, 476,169. Number of United States troops paroled on the field, 16,431; Con-

federate troops paroled on the field, 248,599. Number of United States troops who died while prisoners, 30,156; Confederate troops who died while prisoners, 30,152.

CIVITA VECCHIA (chē'vē-tä-vek'e-a), an Italian fortified port, 50 miles N. W. of Rome, on the Mediterranean. The harbor is both a commercial and naval one, and was originally constructed by the Emperor Trajan; the town indeed owed its origin entirely to the port of this emperor, and hence came to be known as Portus Trajani. The harbor is formed by two moles and a breakwater, on which latter is a lighthouse. The place, which became a free port under Pope Innocent XII. in 1696, is regularly visited by steamers from many Italian, French, and English ports. It suffered at the hands of the Goths and Saracens, and was occupied by the French in 1849. The Papal troops opened the gates of the fortress to the Italian general Bixio in 1870. Pop. about 18,000.

CLACKMANNANSHIRE, the smallest county of Scotland, at the head of the Firth of Forth. Area, 55 square miles; pop. about 35,000.

CLAIMS, COURT OF, a judicial tribunal created by an act of Congress or by legislation of the State to decide claims against the general government or against the States who authorize them.

CLAIRVOYANCE, defined as the power of perceiving without the use of the organ of vision or under conditions in which the organ of vision with its natural powers alone would be useless. It comprises the sight of things past, present, or future. Various methods of Clairvoyance are recounted: by direct vision of things at a distance (opaque substances being no hindrance); by looking into a black surface; by looking into water, into a crystal, etc.; or by laying the object to be described on the forehead or chest of the clairvoyant; but clairvoyants now usually represent the cerebral region as the seat of illumination. From remote antiquity the possession of such powers by favored individuals has been believed. As instances of clairvoyants in later times may be mentioned Jacob Böhme (1575-1624) and Emanuel Swedenborg (1688-1772), the Swedish scientist and founder of the religious body called "The Church of the New Jerusalem." The phenomena of Clairvoyance have been carefully observed. The clairvoyant state seems to be intimately connected with the mesmeric, the somnambulistic, and the so-called "biological." Mesmeric somnambulism and Clairvoyance were first brought to notice by Puysegur in 1784. The clairvoyant is usually in a state of trance, which may be induced by mesmeric passes. In this state he is sometimes conscious only of his mesmerizer; in others, his Clairvoyance is unrestricted; but the Clairvoyant may enter the trance state spontaneously, or he may even be in possession of his ordinary faculties. In "second-sight," as found in Denmark, parts of Germany, and especially in the Highlands of Scotland, the seer is not in a state of trance similar to that in other forms of Clairvoyance. See PSYCHICAL RESEARCH.

CLAM, the popular name of certain bivalvular shell-fish of various genera and species, *e. g.*, the thorny clam (*Chama Lazarus*), the yellow clam (*Tridacna crocĕa*), the giant clam (*T. gigas*), the common clam of the United States (*Mya arenaria*), etc. The giant clam has the largest shell known, and the animal is used as food in the Pacific. The common American clam is found in gravelly mud, sand, and other soft bottoms, especially between high and low water mark. They are largely used for bait, and are a much-relished article of food.

CLAPHAM, a S. W. suburb of London, lying a mile S. of the Thames. Clapham Common is still an open common of 200 acres. Clapham Junction, in Battersea parish, is one of the busiest railway junctions in the world.

CLARE, a maritime county of the province of Munster, Ireland. There are extensive coal fields, fisheries, and sheep and cattle pastures. Chief town, Ennis. Area, 1,332 square miles; pop. about 100,000.

CLARE, JOHN, an English poet; born in Helpstone, near Peterborough, July 13, 1793. He was an agricultural laborer, absolutely uneducated; and wrote "Poems, Descriptive of Rural Life and Scenery," in which a talent not far removed from genius attains many fervent and moving effects. He died in Northampton, May 20, 1864.

CLARE, ST., born in 1193, of a noble family of Assissi; in 1212 retired to the Portiuncula of St. Francis, and in the same year founded the order of Franciscan nuns, which spread rapidly through Europe. She died Aug. 11, 1253. Two years afterward, she was canonized by Alexander IV.; her festival falls on Aug. 12. The NUNS OF THE ORDER OF ST. CLARA (also called the Poor Clares) at first observed the strictest Bene-

dictine rule, but the austerity of this rule was mitigated by St. Francis in 1224, and further modified by Urban IV. in 1265. Several convents adhered to the first and strictest rule; but the large proportion of the nuns adopted Urban's rule, and are distinguished as URBANISTS. The existing convents are chiefly devoted to the education of girls.

CLARE COLLEGE, a college of the University of Cambridge, founded in 1326 by Elizabeth, sister of the Earl of Clare. It has much-admired buildings in the Renaissance style.

CLAREMONT, a town in Sullivan co., N. H.; on the Sugar river, and the Boston & Maine railroad; 48 miles N. W. of Concord. Sugar river, with a fall of 150 feet in a mile, supplies power for numerous local cotton and woolen mills, paper and shoe factories, and machine shops. The town is the farming trade center of the surrounding region and has several churches, weekly newspapers, a high school, free library, public schools, two National banks, etc. Pop. (1910) 7,529; (1920) 9,524.

CLARENDON, CONSTITUTIONS OF, a code of laws adopted in the 10th year of Henry II. (January, 1164), at a council of prelates and barons held at the village of Clarendon, Wiltshire. These laws, which were finally digested into 16 articles, were brought forward by the king as "the ancient customs of the realm," and were enacted as such by the council, but they really involved a great scheme of administrative reform in the assertion of the supremacy of the State over clergy and laity alike. The power of the ecclesiastical courts was restricted, the crown secured the right of interference in elections to ecclesiastical offices, appeals to Rome were made dependent on the king's leave, ecclesiastical dignitaries were deprived of their freedom to leave the country without the royal permission, etc. Becket signed them, but retracted his signature on the refusal of Pope Alexander III. to countenance them. Becket's murder followed, and to effect a reconciliation with the pope Henry promised the amendment of the Constitutions of Clarendon. They were accordingly modified in 1176 at Northampton in favor of the Church, but they are not the less to be regarded as containing the germ of the ecclesiastical policy of Henry VIII.

CLARENDON, EDWARD HYDE, EARL OF, Lord High Chancellor of England; born in Dinton, Wiltshire, in 1608. During the civil wars he zealously attached himself to the royal cause, was made successively chancellor of the exchequer and privy councillor, and was the chief adviser of the king. After the failure of the royalist arms he took refuge in Jersey, and then joined Prince Charles in Holland. He contributed to the Restoration, accompanied Charles II. to London, and was made Lord Chancellor. In his judicial capacity his conduct was irreproachable, and he was the defender of his country's freedom against the abuses of the royal power; but he at length became unpopular, was removed from his high employments, and banished by act of Parliament. His "History of the Rebellion," though considered by some as a partial, inaccurate, and untrustworthy narrative, is one of the most remarkable works in the literature of his time. His daughter Anne was married to the Duke of York, afterward James II., and two daughters, Anne and Mary, the fruit of this marriage, both ascended the English throne. He died in Rouen in 1674.

CLARET, a name originally given to wines of a light-red color, but now applied to the red wines imported from France, chiefly from Bordeaux. These wines vary in composition according to the locality, season, and age, but the produce of each vineyard usually retains its own peculiar characteristics. The most esteemed are those produced at the vineyards of Lafitte, Latour, Château Margaux, and others. Many of the clarets formerly sold in the United States were nothing more than the *vin ordinaire* used by the French peasants and working classes, but the development of the California grape industry made it possible to obtain as good domestic claret here as anywhere.

CLARETIE, JULES (klär-tē'), a French novelist and dramatist; born in Limoges, Dec. 3, 1840. He wrote a long series of very successful novels, the most noteworthy of them being "Madeleine Bertin" (1868); "The Million" (1882); "Monsieur the Minister" (1882); "Noris, Manners of the Time" (1883); "The American Woman" (1892); etc. He wrote also some striking chapters of contemporary history, as "The Revolution of 1870-1871"; "Paris Besieged"; "Five Years After: Alsace and Lorraine Since Annexation." His dramatic compositions relate mostly to the time of the great Revolution. He became administrator of the Comédie Française in 1885, and was chosen member of the Academy in 1888. He died in 1913.

CLARINET, or **CLARIONET**, a musical instrument akin to the clarion. It was modified from the ancient shawm,

its first maker being John Christopher Denner, of Leipsic, who produced it after 1690. It has since been much improved. It consists essentially of a mouth-piece furnished with a single beating reed, a cylindrical tube ending in a bell, and provided with 18 openings in the side, half of which are closed by the fingers, and half by the keys.

CLARK, ALVAN, an American astronomical-instrument maker; born in Ashfield, Mass., March 3, 1804. He was at one time a portrait painter in Boston; but in 1844 his attention was turned to telescope making. Two years later he definitely adopted the business of astronomical-instrument making, and in time achieved a world-wide reputation. His famous telescopes include the Chicago 18½-inch, the Washington 26-inch, the Russian 30-inch, and the California 36-inch. He died in Cambridge, Mass, Aug. 9, 1887. His son, ALVAN GRAHAM CLARK, born in Fall River, Mass., July 10, 1832, received a grammar school education; and was associated with his father, and his brother, George, in the manufacture of telescopes. He supervised the construction of various famous lenses and made discoveries of stars with instruments of his own manufacture. He died in 1897.

CLARK, CHAMP, an American Congressman; born in Anderson co., Ky., March 7, 1850. He was admitted to the bar in 1875, and has been in practice since that date. In 1878-1881 he was city attorney of Louisiana, and Bowling Green, Mo., and in 1885-1889 prosecuting attorney of Pike co. He was always active in politics, having been presidential elector in 1880, and a delegate to several national conventions. In 1893 he was elected to the 53d Congress, and was returned to the 55th and all others to the 67th. In 1911 he was made speaker of the House of Representatives to succeed Joseph G. Cannon and served until 1919. He has served on several important committees, and was vice-president of the Trans-Mississippi Congress at Denver. At the Democratic National Convention, held in Baltimore in 1912, he led on 27 ballots for the Presidential nomination, but was eventually defeated by Woodrow Wilson. He died Mar. 3, 1921.

CLARK, CHARLES EDGAR, an American naval officer; born in Bradford, Vt., Aug. 10, 1843. He entered the naval service in 1860; took part in the battle of Mobile Bay and in the bombardment of Fort Morgan; and was promoted captain in 1896. In March, 1898, he took command of the battleship "Oregon" at the Mare Island navy yard, San Francisco, and when war with Spain was deemed inevitable, he received orders to proceed to Key West, Fla., with all haste. After a most remarkable voyage of over 14,000 miles, he joined the American fleet in Cuban waters on May 26, and on July 3 commanded his ship at the destruction of Cervera's squadron. In 1902 he was promoted rear-admiral and retired in 1905.

CLARK, CLARENCE DON, a United States Senator from Wyoming, born in Oswego co., N. Y., in 1851. He graduated from Iowa State University, and after admission to the bar, practiced in Wyoming. He was chosen to the 51st and 52d Congresses, and in 1895 became United States Senator to fill a vacancy caused by the failure of the Legislature to elect. He was re-elected in 1898, in 1904, and in 1910, serving until 1917.

CLARK, EDGAR ERASTUS, an American public official, born at Lima, N. Y., in 1856. After being educated at the Genesee Wesleyan Seminary at Lima, N. Y., he entered the railway service in 1873 and remained in that employment until 1889, when he became Grand Senior Conductor of the Order of Railway Conductors of America. He was Grand Chief Conductor from 1890 to 1906. In 1902 he was appointed by President Roosevelt as a member of a commission to determine the issues involved in the anthracite coal strike. In 1906 he was appointed a member of the Interstate Commerce Commission, and was re-appointed by President Wilson in 1913.

CLARK, FRANCIS EDWARD, an American clergyman; born in Aylmer, Quebec, Sept. 12, 1851; graduated from Dartmouth College in 1873, and continued his studies at Andover Theological Seminary. He became pastor of a Congregational Church at Portland, Me., and there organized the first Young People's Society of Christian Endeavor, Feb. 2, 1881. In 1887 he was made president of the United Society of Christian Endeavor, and president of the World's Christian Endeavor Union, and also became editor of the "Christian Endeavor World," the official organ of the society. He was the author of many books on religious subjects as well as of books of travel, and published many leaflets, sermons, addresses, etc.

CLARK, or **CLARKE, GEORGE ROGERS**, an American pioneer; born near Monticello, Va., Nov. 19, 1752. He studied surveying, and settled in Ohio, serving in the Indian wars of that time and region. He removed to Kentucky in 1775, procuring the organization of that

territory. On the outbreak of the Revolutionary War he led the patriot army on the frontier, campaigning against the British throughout Illinois, Ohio, and Kentucky. His success in this saved much territory to the colonies in the final treaty of peace with Great Britain. He fell into penury in his latter years, and died in neglect near Louisville, Ky., Feb. 18, 1818.

CLARK, JOHN BATES, an American economist; born in Providence, R. I., Jan. 26, 1847. He was graduated at Amherst in 1872, studied at the Universities of Heidelberg and Zurich, and received degrees from several domestic and foreign universities. He was professor of political economy at Carleton College (1877-1881), Smith College (1882-1893), Amherst (1892-1895), and assumed the same chair at Columbia University in 1895. He was a member of many domestic and foreign scientific associations, one of the editors of the "Political Science Quarterly," and contributed many articles to economic reviews and journals. He also published: "Philosophy of Wealth" (1885); "Distribution of Wealth" (1895); "Control of Trusts" (1901); "Problem of Monopoly" (1904); "Essentials of Economic Theory" (1907); "Modern Distributive Process" (with F. H. Giddings); etc.

CLARK, LEWIS GAYLORD, an American journalist and humorous writer; born in Otisco, N. Y., March 5, 1810. In 1834 he became editor of the "Knickerbocker Magazine," and with Irving, Bryant, Longfellow, Halleck, and Willis, as contributors, made it the foremost literary publication of that time, and an inspiration to a higher standard of periodical literature. The "Editor's Table," written by him, overflowed with amusing stories and witty sayings. The "Knickerbocker Sketch-Book" (1850), and "Knick-Knacks from an Editor's Table" (1853), are his only publications in book form. He died in Piermont, N. Y., Nov. 3, 1873.

CLARK, WILLIAM ANDREWS, an American capitalist and senator; born near Connellsville, Pa., Jan. 8, 1839. He was educated at Laurel Hill Academy, and at Mt. Pleasant University, in Iowa. After studying law and teaching school he settled in Montana in 1863, and acquired a great fortune in copper mining. He was the Democratic choice for United States Senator from Montana in 1890 and 1896, and in 1899 the Legislature elected him. In April, 1900, the United States Senate declared his election void; but his legislature re-elected him in 1901 and he served until 1907. In his palatial home in New York City he has collected many rare paintings.

CLARK, WILLIS GAYLORD, an American poet, twin brother of Lewis Gaylord; born in Otisco, N. Y., March 5, 1810; became associate editor of the "Columbian Star," a religious weekly paper (1830), but resigned shortly after to take charge of the Philadelphia "Gazette." A complete edition of his poems, edited by his brother, appeared in 1847. He died in Philadelphia, Pa., June 12, 1841.

CLARK COLLEGE, an institution for higher education, founded at Worcester, Mass., in 1902. It was endowed by Jonas G. Clark with $1,300,000 and was granted equal rights in the already existing Clark University. It is legally the collegiate department of the University, but under the terms of the will of the founder, it is a completely independent organization. In 1918 there were 184 students and 25 members of the faculty. President, Edmund C. Sandford.

CLARKE, CHARLES COWDEN, an English prose-writer and poet; born in Enfield, Middlesex, Dec. 15, 1787; produced "Tales from Chaucer" and "Shakespeare's Characters," besides lectures and essays innumerable; and "Carmina Minima," a volume of verse. He died in Genoa, March 13, 1877.

CLARKE, FRANK WIGGLESWORTH, an American scientist; born in Boston, Mass., March 19, 1847. He was graduated at the Lawrence Scientific School of Harvard, in 1867; was Professor of Chemistry and Physics at the University of Cincinnati from 1874 to 1883, and in 1883 became chief chemist of the United States Geological Survey and honorary curator of minerals, United States National Museum, Washington, D. C. He was a member of many domestic, foreign, and international commissions and scientific societies, received several honorary degrees and medals, and published numerous books and papers on chemical, mineralogical, and geological topics.

CLARKE, JAMES FREEMAN, an American Unitarian clergyman and author; born in Hanover, N. H., April 4, 1810. In 1852, together with Emerson and William H. Channing, he prepared the "Memoirs of Margaret Fuller d'Ossoli." His chief work was "Ten Great Religions" (1871-1883). Among his other publications were "Self-Culture" (1882); "Anti-Slavery Days" (1884); "Every-Day Religion" (1886);

and "Vexed Questions" (1886). He died in Boston, Mass., June 8, 1888.

CLARKE, JAMES P., an American lawyer and public official; born in Yazoo City, Miss., Aug. 18, 1854. He was graduated in the law department of the University of Virginia in 1878, and shortly after entered politics. He was elected to the State Legislature in 1886 and 1887, and to the State Senate in 1888, of which body he was President in 1891. In 1893-1894 he was Attorney-General of the State, and in January, 1895, was inaugurated Governor after a spirited triangular contest. In 1903-1909 he was United States Senator, and was re-elected in 1908 and 1914. For several years he was Chairman of the Senate Committee on Commerce, and the ranking Democratic member of the Foreign Relations and Military Affairs Committees. He died in 1916.

CLARKE, JOHN HESSIN, an American jurist, born at Lisbon, O., in 1857. He graduated from the Western Reserve University in 1877, and was admitted to the bar in the following year. After some general practice, he was employed as general counsel of several railroads. He was appointed United States district judge for the Northern District of Ohio, from 1914 to 1916, when he became associate justice of the Supreme Court of the United States.

CLARKE, MARY COWDEN, an English story-writer, essayist, and Shakespearean scholar; born in London, June 22, 1809. She married Charles Cowden Clarke, with whom she wrote the "Shakespeare Key" and compiled an edition of Shakespeare's plays. Her own "Complete Concordance" is universally known Among her novels are: "A Rambling Story" and "The Iron Cousin." "World-Noted Women" contains biographical studies. She died in Italy, Jan. 12, 1898.

CLARKE, SAMUEL, an English theological and philosophical writer; born in Norwich, in 1675; educated at Caius College, Cambridge. He became chaplain to Dr. More, bishop of Norwich, and between 1699 and 1701 published "Essays on Baptism, Confirmation, and Repentance," replied to Toland's "Amyntor," and issued a paraphrase of the Gospels. He was then presented with two livings, and in 1704 and 1705 twice delivered the Boyle lectures at Oxford. In 1706 he published "Immortality of the Soul," and a Latin version of Newton's "Optics." He was appointed rector of St. James's, London, and chaplain to Queen Anne. In 1712 he edited Cæsar's "Commentaries," and published his "Scripture Doctrine of the Trinity." His chief subsequent productions were his discussions with Leibnitz and Collins on the "Freedom of the Will," his Latin version of part of the "Iliad," and a considerable number of sermons. His philosophic fame rests on his *a priori* argument for the existence of God, his theory of the nature and obligation of virtue as conformity to certain relations involved in the eternal fitness of things, and his opposition to Hobbes, Spinoza, Locke, Leibnitz, and others. He died in 1729.

CLARKSBURG, a city of West Virginia, the county-seat of Harrison co. It is on the Baltimore and Ohio, and the Monongahela Traction Co. railroads, and on the Monongahela river. The city has important manufacturing industries, including the manufacture of chemicals, fire brick, bottles, tableware, iron and tin plate, etc. It has an Elks' Home, and three hospitals, and is the center of an important coal, oil, and natural gas region. Pop. (1910) 9,201; (1920) 27,869.

CLARKSVILLE, a city and county-seat of Montgomery co., Tenn., on the Cumberland and Red rivers, and the Louisville and Nashville and the Tennessee Central railroads, 50 miles N. W. of Nashville. It is the center of the great "dark tobacco belt," and has many tobacco factories. It is the seat of the Southwestern Presbyterian University (1874), and the State Odd Fellows' Home; has several manufactories, daily and weekly newspapers, a female academy, high and graded public schools, 2 National banks, etc. Pop. (1910) 8,548; (1920) 8,110.

CLARK UNIVERSITY, an institution at Worcester, Mass., founded in 1887 by Jonas Gilman Clark, and devoted exclusively to post-graduate work. At the close of the school year 1919 the university reported: professors, 21; students, 106; volumes in the library, 85,000; president, G. Stanley Hall, LL. D.

CLAUDE LORRAINE, a landscape-painter whose real name was Claude Gelée, but who was called Lorraine from the province where he was born in 1600. When 12 years old he went to live with his brother, an engraver in wood at Freiburg, went from him to study under Godfrey Watts at Naples, and was afterward employed at Rome by the painter Agostino Tassi, to grind his colors and do the household drudgery. On leaving Tassi he traveled in Italy, France, and Germany, but settled in 1627 in Rome, where his works were greatly sought for, and where he lived much at his ease until 1682, when he died of gout. The principal galleries of Italy, France, Eng-

land, Spain, and Germany are adorned with his paintings; that on which he himself set the greatest value being the painting of a small wood belonging to the Villa Madama (Rome). He excelled in luminous atmospheric effects, of which he made loving and elaborate studies. His figure work, however, was inferior, and the figures in many of his paintings were supplied by Lauri and Francesco Allegrini. He made small copies of all his pictures in six books known as "Libri di Verità" (Books of Truth), which form a work of great value (usually called the Liber Veritatis), and much esteemed by students.

CLAUDIUS I., TIBERIUS DRUSUS NERO, surnamed Germanicus, and Britannicus, the fourth Emperor of Rome; born in Lyons, 10 B. C. After spending 50 years of his life in a private station, unhonored, and but little known, he was, on the murder of Caligula, his nephew, A. D. 41, proclaimed Emperor by the soldiers, and confirmed in the sovereignty by the Senate. At first he performed some praiseworthy acts, but he soon became contemptible for his debauchery and voluptuousness; and he died, A. D. 54, of poison administered by his second wife, Agrippina. Claudius went to Britain two years after his accession, and made it a Roman province. He built the port of Ostia, the Claudian aqueduct, and executed other great works.

CLAUDIUS II., MARCUS AURELIUS FLAVIUS, surnamed Gothicus, Roman Emperor; born in Illyria, A. D. 214, was raised to the throne on the death of Gallienus, in 268, and by his virtues as well as his splendid victories over the Goths, proved himself worthy of his exalted station. He died in A. D. 270.

CLAUDIUS CRASSUS, APPIUS, a Roman decemvir (451 and 450 B. C.), who gained the high favor of his fellow-citizens by his ability and activity. In the latter year, however, he began to show his real aims toward absolute and illegal power. The growing indignation of the Roman populace reached a height on account of his grossly tyrannous action toward Virginia, daughter of a respected plebeian named Lucius Virginius, who was abroad with the army. The proud patrician gained possession of the person of the maiden by pretending that she was the born slave of one of his clients. Her lover Icilius summoned her father Virginius from the army, but another mock-trial again adjudged the girl to be the property of the decemvir's client. To save his daughter from dishonor, the unhappy father seized a knife and slew her. The popular indignation and the father's appeal to the army overthrew the decemviri, and the proud Appius was flung into prison, where he died by his own hand. The story is specially familiar to English readers from Macaulay's "Lays."

CLAUSEWITZ, KARL VON (klouz'e-vĕtz), a Prussian military officer; born in Burg, June 1, 1780. He served with distinction in several campaigns in the Prussian and Russian services in 1815, became chief of a Prussian army corps, and was ultimately director of the army school, and inspector of artillery. He died in Breslau, Nov. 16, 1831. Of his works the best known are his great book "Of War" (3 vols., 4th ed., 1880), and his "Life of Scharnhorst."

CLAVARIA, a genus of fungi, some species of which are edible.

CLAVERHOUSE. See GRAHAM, JOHN.

CLAVICHORD, a key and stringed instrument, not now in use, being superseded by the pianoforte. Its form is that of a small pianoforte; it has no quills, jacks, or hammers. The strings are all muffled, and the tone is produced by little brass wedges, placed at the ends of the keys, which, when pulled down, press against the middle of the strings, acting as a bridge to each.

CLAVIGERO, FRANCESCO SAVERIO (klä-vē-hā'ro), a Spanish historian; born in Vera Cruz, Mexico, about 1720. He was educated as an ecclesiastic, and resided 36 years in the provinces of New Spain, where he acquired the languages of the Mexicans and other indigenous nations, collected many of their traditions, and studied their historical paintings and other monuments of antiquity. On the suppression of the Jesuits by the Spanish government in 1767 Clavigero went to Italy, the Pope assigning him a residence in Cesena, where he wrote his "Mexican History," and died in 1793.

CLAXTON, KATE (MRS. CHARLES A. STEVENSON), an American actress; born in Somerville, N. J., in 1848. She made her début at Daly's Theater before she was out of her teens, but her success dates from 1873 when she acted Mathilda in "Led Astray." As Louise in "The Two Orphans" she attained great celebrity. She was playing the part at the Brooklyn Theater when, on the night of Dec. 5, 1876, that structure was destroyed by fire with great loss of life. After 1896 she toured the country in emotional plays with her own company, retiring from the stage in 1904.

CLAXTON, PHILANDER PRIESTLY, an American educator; born in Bedford co., Tenn., Sept. 28, 1862. He graduated from the University of Tennessee in 1882 and pursued special studies at Johns Hopkins University, 1884-1885; became professor of pedagogy at North Carolina State Normal and Industrial College in 1896; and was appointed United States Commissioner of Education in 1911. He has written largely on educational subjects.

CLAY, the name of various earths, which consist of hydrated silicate of aluminum, with small proportions of the silicates of iron, calcium, magnesium, potassium, and sodium. All the varieties are characterized by being firmly coherent, weighty, compact, and hard when dry, but plastic when moist, smooth to touch, not readily diffusable in water, but when mixed not readily subsiding in it. Their tenacity and ductility when moist and their hardness when dry has made them from the earliest times the materials of bricks, tiles, pottery, etc. Of the chief varieties porcelain Clay, kaolin, or China Clay, a white Clay with occasional gray and yellow tones, is the purest. Potter's Clay and pipe Clay, which are similar but less pure, are generally of a yellowish or grayish color, from the presence of iron. Fire Clay is a very refractory variety, always found lying immediately below the coal; it is used for making fire bricks, crucibles, etc. Loam is the same substance mixed with sand, oxide of iron, and various other foreign ingredients. The boles, which are of a red or yellow color from the presence of oxide of iron, are distinguished by their conchoidal fracture. The ochres are similar to the boles, containing only more oxide of iron. Other varieties are fuller's-earth, Tripoli, and boulder Clay, the last a hard Clay of a dark-brown color, with rounded masses of rock of all sizes embedded in it, the result of glacial action. The distinctive property of Clays as ingredients of the soil is their power of absorbing ammonia and other gases and vapors generated on fertile and manured lands; indeed no soil will long remain fertile unless it has a fair proportion of Clay in its composition. The best wheats both in America and Europe are grown on calcareous Clays, as also the finest fruits and flowers of the rosaceous kind.

The following shows the value of the Clay industry in the United States for the calendar year 1919 (est.):

Common brick	$58,220,000
Vitrified brick or block	11,210,000
Face brick	15,240,000
Fancy or ornamental brick	40,000
Enameled brick	$640,000
Drain tile	10,420,000
Sewer pipe	16,170,000
Architectural terra cotta	4,840,000
Fireproofing and hollow building tile	16,620,000
Tile (not drain)	7,250,000
Stove lining	730,000
Fire brick	36,170,000
Miscellaneous	7,100,000
Total brick and tile	$184,650,000
Total pottery	76,140,000
Grand total	$260,790,000

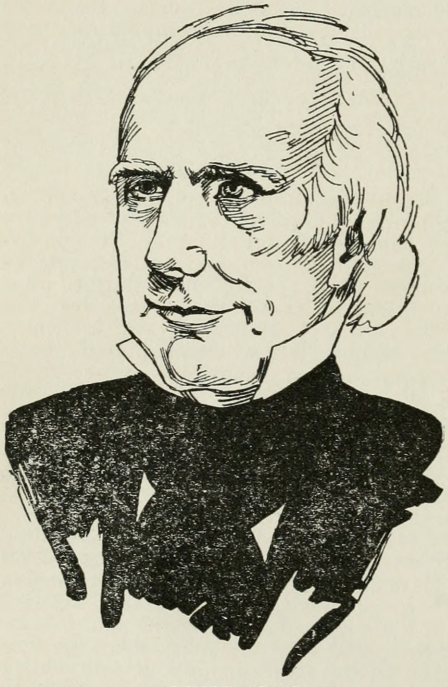
The total imports of Clay products in 1919 were valued at $7,366,535, of which $7,230,061 were pottery products, and $136,474 brick, tile, etc. In the same year the total exports were valued at $6,582,284.

CLAY, CASSIUS MARCELLUS, an American statesman; born in Madison co., Ky., Oct. 19, 1810. He was graduated at Yale College in 1832, and three years later was elected to the Legislature of Kentucky. He opposed the annexation of Texas, supported Henry Clay, and served in the Mexican War. He was an opponent of slavery and supported Lincoln for the Presidency. From 1862 to 1869 he was Minister to Russia. In 1886 he published his speeches, edited by Horace Greeley. In 1896 he was prominent as a "gold" Democrat. He died July 22, 1903.

CLAY, HENRY, an American statesman; born in "The Slashes" district, Hanover co., Va., April 12, 1777. Becoming a student of law, in his 21st year, he was admitted to the bar, and began practice at Lexington, Ky. His success was signal and immediate. About 1804 he entered politics, and in 1806 became United States Senator for a single year, to fill the unexpired term of Mr. Adair; and in 1811 was elected to, and chosen speaker of, the House of Representatives, remaining in that post till 1814, when he was sent abroad as one of the commissioners to negotiate the treaty of peace with England at Ghent. On his return he was again sent to Congress, and re-elected to his old position as speaker. In 1824 he was a candidate for the Presidency against J. Q. Adams, General Jackson, and W. H. Crawford, and no choice being effected in the Electoral College, when the matter came up to the House of Representatives, Clay and his friends voted for Mr. Adams, thereby securing his election. During the entire period of the Adams administration, 1825-1829. Clay was Secretary of State. In 1831, he returned to the United States Senate,

and became the leader of the opposition to General Jackson's government.

In 1832, he was again the candidate of his party for the Presidency, though with little chance of success, owing to the overwhelming popularity of General Jackson, who was re-elected. In March, 1842, he resigned his seat in the Senate, and retired into private life, till 1844, when he came forward a third time as a candidate for the Presidential chair. In one of the most exciting political contests that ever occurred in the United States he was again defeated, but by a very small numerical majority, obtained mainly through the influence of the administration—then in the hands of his political opponents—and the obstinacy of the so-called "liberty party." The immediate consequence of this defeat was the annexation of Texas,



HENRY CLAY

a measure to which he had given his strenuous opposition. This was virtually the termination of his public career, though, in 1849, he consented to resume his seat in the Senate, in view of the perilous contest which was then impending between the slave-holding party and its opponents, on the California and territorial questions. He was the author of the celebrated "Compromise of 1850," as it was termed, by which, after a long and vehement struggle, this dispute was, for the time being, adjusted.

This was the third occasion in his career in which, by giving the whole weight of his abilities and influence to an intermediate course between two extremes, he put an end to a violent conflict of opinion, which menaced the peace of the country, and the duration of the Union. On the question of slavery, he always favored moderate counsels, and a pacificatory policy. The excitement and exhaustion occasioned by this last great controversy gave the final blow to his already enfeebled constitution, and he died in Washington, June 29, 1852.

CLAY SLATE, in geology, a rock consisting of clay which has been hardened and otherwise changed, for the most part extremely fissile and often affording good roofing-slate. In color it varies from greenish or bluish gray to lead color.

CLAYTON-BULWER TREATY, a convention between the United States and Great Britain, concluded April 19, 1850, and deriving its name from John M. Clayton, Secretary of State of the United States, and Sir Henry Bulwer, British Minister at Washington. The object of the treaty was to aid the construction of an inter-oceanic canal on either the Nicaragua or Panama routes.

CLEANTHES, a Greek Stoic philosopher of the 3d century B. C. He was a native of Assus, in Lydia; but, visiting Athens, he became a zealous disciple of Zeno, and to enable him to attend on that master in the day, he was accustomed to labor by night. His mental and bodily strength was immense, and despite all obstacles, he studied so successfully as to become, 263 B. C., Zeno's successor. Of his writings only some fragments remain, among which is his noble "Hymn to Zeus."

CLEARCHUS (klē-är'kus), a Spartan general who commanded about 13,000 Greeks in the army of Cyrus the Younger when he tried to conquer the throne of Persia from his brother, Artaxerxes II. When Cyrus was defeated at Cunaxa (401 B. C.), Clearchus and his chief officers were seized by treachery and put to death.

CLEARFIELD, a borough of Pennsylvania, the county-seat of Clearfield co. It is on the Pennsylvania, the New York Central and Hudson River, and the Buffalo, Rochester and Pittsburgh railroads, and on the Susquehanna river. It is the center of an important coal and fire clay region. Its industries include novelty works, flour mills, knitting mills, brickyards, the manufacture of sewer pipes, cut glass, etc. Pop. (1910) 6,851; (1920) 8,529.

CLEARING-HOUSE, a financial institution which makes daily adjustment of debits and credits among the banks constituting its membership.

In the old days before the American clearing-houses were established, Bank No. 1 sent a runner to Bank No. 2 with the check to get it cashed; and if No. 2 had a check on No. 1, it sent its runner over; and so on, all through all the banks. But now each morning the clearing-house clerks of a bank report at the clearing-house, and make out a list of all the checks payable to that bank by or through other banks; then the clearing-house people take these lists, and compare them. They find, for instance, that Bank A owes B $1,000 and C $500; that B owes A $500 and C $1,000, and that C owes A $500 and B $500. Comparing these, we see that A owes B $500 clear of what B owes A, and that A and C stand off; that B owes nothing to A, and owes $500 to C; and that C owes nothing to A, and is owed $500 by B. That is, that A owes B $500, and B owes C $500. Then if A pays C $500, $4,000 of mutual debts is settled for $500. When this settlement is worked out, the clearing-house clerks report back to their banks, and before 1 o'clock sums of money are sent from each bank to the clearing-house in settlement of balances, and the checks drawn on each bank are returned to it, to be charged against the different individual depositors.

The following table shows the amount of exchanges at the various clearing-houses of the United States for two years, each ending Sept. 30:

	1920	1919
New York....	$252,338,249,000	$214,703,444,000
Boston.....	19,570,085,000	16,990,409,000
Chicago.....	32,845,595,000	28,223,025,000
Philadelphia.	25,035,910,000	21,320,246,000
St. Louis....	8,557,096,000	8,065,368,000
San Francisco	8,272,028,000	6,703,134,000
Baltimore....	4,843,326,000	4,196,983,000
Pittsburgh...	8,549,277,000	6,998,946,000
Cincinnati....	3,567,833,000	3,047,801,000
Kansas City..	12,318,929,000	11,036,406,000
New Orleans..	3,562,716,000	2,890,884,000
Minneapolis..	3,521,955,000	2,263,056,000
Detroit.....	5,063,224,000	4,032,443,000
Louisville....	1,153,048,000	993,855,000
Cleveland....	6,755,509,000	5,104,301,000
Other cities..	67,065,470,000	50,521,640,000
Total.....	$463,020,250,000	$387,091,941,000

CLEAVAGE, the manner or direction in which substances regularly cleave or split. The regular structure of most crystallized bodies becomes manifest as soon as they are broken. Each fragment presents the form of a small polyhedron, and the very dust appears under the microscope an assemblage of minute solids, regularly terminated. The directions in which such bodies thus break up are called their planes of cleavage; and the cleavage is called basal, cubic, diagonal, or lateral (or peritomous), according as it is parallel to the base of a crystal, to the faces of a cube, to a diagonal plane, or to the lateral planes. In certain rocks again there is a tendency to split along planes which may coincide with the original plane of stratification, but which more frequently crosses it at an angle. This tendency is the consequence of the readjustment by pressure and heat of the components of rocks, which is one of the phases of metamorphism.

CLEBURNE, a city of Texas, the county-seat of Johnson co. It is on the Gulf, Colorado and Santa Fe, the Trinity and Brazos Valley, and the Missouri, Kansas and Texas railroads. Its industries include cotton compresses, flour mills, foundry and machine shops, and railroad shops, and it has a large trade in grain, live stock, hides, agricultural products, etc. There is a court house, a public library, and a high school. Pop. (1910) 10,364; (1920) 12,820.

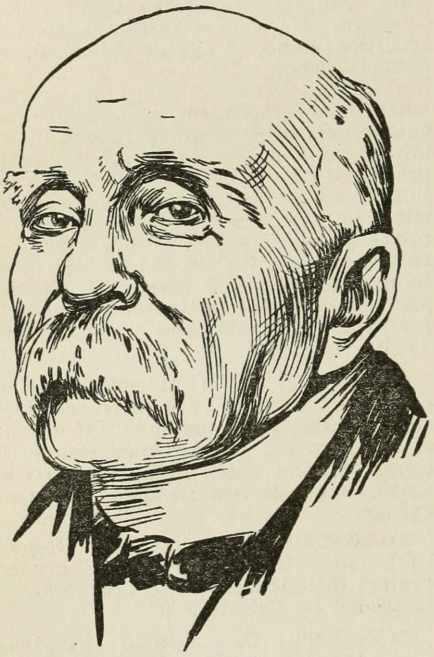
CLEF, a character placed at the beginning of a stave, to show the elevation of that particular stave in the general claviary or system, and to determine the names of the notes according to their positions on the stave. There are three Clefs; the G Clef, generally known as the treble Clef, which is placed on the second line of the treble stave; the C Clef, which is used either as the alto, tenor, or (rarely) soprano Clef, according to its position on the third, fourth or first line of the stave; and the F Clef, which is either bass or baritone (rare) Clef, according to its position on the fourth or third line of the stave.

CLÉMENCEAU, GEORGES BENJAMIN EUGENE, French statesman; born at Féole, Vendée, Sept. 28, 1841. His early schooling was at Nantes, whence he went to Paris, where he began the study of medicine. His republican opinions led to his suspension from the university, and it was not till after a long interval, during which he visited the United States (1865-1869), that he was able to return and obtain his diploma. The next year he was chosen mayor of the arrondissement of Montmartre, Paris, and during the struggle with the Commune, acted as an intermediary between the revolutionists and the Government of the Republic.

Clémenceau's long legislative career began in 1871, when he was elected Deputy. For a time he was Member and President

of the Municipal Council of Paris, but from 1876 to 1893, his service in the Chamber of Deputies was continuous. There he took his place with the radicals of the extreme left, and rapidly rose to leadership. He was prominent in the overthrow of the ministries of Gambetta (1882), Ferry (1885), Brisson (1886) and Freycinet (1886). Boulanger also found in him a formidable opponent.

The Panama scandal of 1892 cast unfavorable reflections on Clémenceau and caused a vigorous and successful cam-



GEORGES B. E. CLÉMENCEAU

paign to be waged against his re-election (1893). He then, for a few years, devoted himself entirely to journalism and the editorship of "La Justice," founded by him in 1880. Later (1900-1902) he published "Le Bloc," and after his election to the Senate (1902), edited "L'Aurore" (1903-1907), in which he had ardently supported the cause of Dreyfus. Later he became the editor of the newspaper, "L'Homme Libre."

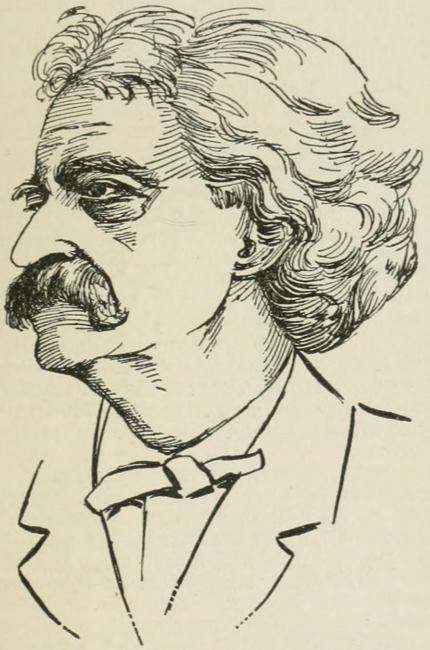
The destroyer of so many ministries consented for the first time to accept a portfolio in March, 1906, whence he became Minister of the Interior in the Sarrien Cabinet. In October of the same year he was called upon to form the ministry which was to be of such long duration. Starting with an anti-clerical and even socialistic platform. Clémenceau soon won other than radical votes by his firmness in upholding the powers of the Government against the demands of any of the classes of the people, as he showed in his handling of the troubles in the wine-growing districts and in the energetic measures he used to control matters during the mining and other strikes. At the same time he pushed the reforms that aimed at the relief of the working element of the population, such as the employers' liability law and the bill creating old age pensions. The downfall of his ministry occurred unexpectedly July 20, 1909, because of Clémenceau's personal attack on Delcassé, former Minister of Foreign Affairs.

During the World War, he was an enthusiastic advocate of determined military action and an unsparing critic of timid policies on the part of the government. He exposed the treason of Bolo Pasha, and in November, 1917, succeeded Painlevé as Premier. At that time Allied prospects were most discouraging, owing to the Russian defection and the preparations by the Germans for the great spring drive of 1918. But before long, Clémenceau's indomitable courage and magnificent energy had stimulated the national spirit and paved the way for the final victory. When the German cause finally collapsed, Clémenceau was chosen President of the Peace Conference. While the Conference was in progress, he was shot by an assassin, but the wounds he received were not fatal, and he himself intervened to prevent the death penalty being carried out upon his assailant. In 1920, he was a candidate for President, but withdrew his name before the election. Immediately afterward, Clémenceau started on a journey to Egypt and the Orient, and later went to India.

Clémenceau was the author of several books and plays, the most important of which are the following: "De la génération des éléments anatomiques"; "La mêlée sociale" (1894); "Le grand Pan" (1895); "Les massacres d'Arménie" (1896); "Les plus forts" (1898); "Au pied du Sinai" (1898); "L'iniquité" (1899); "Vers la réparation" (1899); "Contre la justice" (1900) (the last three republished from "L'Aurore," in defense of Dreyfus); "Au fil des jours" (1900); "Le voile du bonheur" (1901); "Aux embuscades de la vie" (1903); "La grande honte" (1903); "Figures de Vendée" (1903), etc.

CLEMENS, SAMUEL LANGHORNE (best known by his pen name of MARK TWAIN), an American humorist; born in Florida, Mo., Nov. 30, 1835. He worked for some time as a compositor in Philadelphia and New York, and then in 1851 learned the business of pilot on the Mis-

sissippi. Thence he went to the Nevada mines; became in 1862 local editor of a newspaper in Virginia City; went to San Francisco; was for some time a reporter; and worked in the Calaveras gold-diggings. In 1884, he founded the publishing firm of C. L. Webster & Co., which failed some years later, though it had published successful works, including General Grant's "Personal Recollections," on which over $300,000 in royalties were



S. L. CLEMENS (MARK TWAIN)

paid. After the failure Mr. Clemens made a lecturing tour of the world for the purpose of paying the firm's indebtedness, which he insisted on doing in full, though the creditors offered to settle for half of the amount. His works include: "The Jumping Frog," "The Innocents Abroad," "Roughing It," "A Tramp Abroad," "The Prince and the Pauper," "Life on the Mississippi," "The Gilded Age" (with Charles Dudley Warner), "Old Times on the Mississippi," "Tom Sawyer," "Huckleberry Finn," "A Connecticut Yankee at King Arthur's Court," "Pudd'nhead Wilson," "Personal Recollections of Joan of Arc," "Following the Equator," etc. He died April 21, 1910.

CLEMENS, TITUS FLAVIUS, known as CLEMENT OF ALEXANDRIA, one of the fathers of the Church; born about the middle of the 2d century. Of his early career so little is known that it is doubtful whether he was born at Alexandria or at Athens; but about the year 189 he succeeded Pantænus in the catechetical school of the former city and taught there until 202, when the edict of Severus compelled him to seek a new abode. In 210 he was in Cappadocia. He died about 220.

CLEMENT I., CLEMENS ROMANUS, POPE, and one of the apostolic fathers; born about A. D. 30. It is supposed that he is the same Clement mentioned by St. Paul (Phil. iv: 3) as one of his fellow-laborers. He was, according to Catholic tradition, baptized by St. Peter, and ordained Bishop of Rome in 91, succeeding to Anacletus. Among the writings which are attributed to him are one epistle exhorting to unity (generally admitted as genuine); two other epistles preserved by the Syriac Church; the two collections of apostolical canons and constitutions; and the "Clementines," a narrative of his life, and of his connection and journeys with St. Peter. He is accounted a saint and martyr in the Roman calendar, his festival being Nov. 23. He died about 100, and was succeeded by Evaristus.

CLEMENT II. (SUIDGER), was of Saxon birth, and in 1046 succeeded Gregory VI., who was Pope during the tenure of Benedict IX. He crowned Henry III. Emperor, and died 1047; and at his death, Benedict was restored to the papal see.

CLEMENT III., succeeded Gregory VIII. in 1187, preached a crusade against the Saracens; died 1191, and was succeeded by Celestine III.

CLEMENT IV. (GUIDO FULCODI), succeeded Urban IV. in 1265. He signed, with St. Louis of France, the "Pragmatic Sanction," which put an end to the differences existing between Rome and France. He died in Viterbo, 1268. His death was followed by a long interregnum.

CLEMENT V. (BERTRAND DE GOT), succeeded Benedict XI. in 1305, and removed the residence of the Popes from Rome to Avignon. He was the tool of Philip the Fair of France, and, at his desire, suppressed the order of Knights Templar. He died in 1314, and had no immediate successor.

CLEMENT VI. (PIERRE ROGER), a native of Limousin, succeeded Benedict XII. in 1342. During his pontificate, Rienzi attempted to establish the republic at Rome. His learning and eloquence are applauded by Petrarch. He died in Avignon, 1352. His successor was Innocent VI.

CLEMENT VII. (GIULIO DE MEDICI), nephew of Lorenzo the Magnificent, and cousin of Leo X., succeeded Adrian VI. in 1523. He entered into the "holy league" with Francis I. of France, the Italian princes, and Henry VIII. of England, against the Emperor Charles V. In the war which ensued, Rome was taken and plundered, and the Pope himself was shut up in the castle of St. Angelo. He had, consequently, to make terms with Charles. Subsequently, Henry VIII., having repudiated Catharine of Aragon and married Anne Boleyn, Clement excommunicated him in 1534. This occasioned a schism, and ultimately resulted in the separation of England from the Church of Rome. He died in 1534, and was succeeded by Paul III.

CLEMENT VIII. (IPPOLITO ALDOBRANDINI), born in Fano, 1536, was elected in 1592, succeeding Innocent IX. He absolved Henry IV. of France, upon that monarch making public profession of Catholicism, and was chiefly instrumental in bringing about the peace of Vervins in 1598. He elevated to the rank of cardinal, Baronius, Bellarmine, and other distinguished men, and was a learned and sagacious pontiff. He died in 1605 and was succeeded by Leo XI.

CLEMENT IX. (GIULIO ROSSPIGLIOSI), born in Pistoia, 1600; succeeded Alexander VII. in 1667. During his pontificate, Candia was taken from the Venetians by the Turks. He died in 1666, and was succeeded by

CLEMENT X. (EMILIO ALTIERI), born in 1590. Being of great age, the government was left in the hands of Cardinal Paluzzi, a distant relative. He died in 1676, and was succeeded by Innocent XI.

CLEMENT XI. (GIOVANNI FRANCESCO ALBANI), born in Pesaro, 1649, succeeded Innocent XII., 1700. His pontificate was disturbed by the quarrels of the Jesuits and the Jansenists, and on issuing the famous bull "Unigenitus," a schism was produced, which lasted many years, between France and Rome. He died in 1721, and was succeeded by Innocent XIII.

CLEMENT XII. (LORENZO DI CORSINI), born in Florence, 1652, succeeded Benedict XIII. in 1730, and reformed many abuses of the Church. He died in 1740, and was succeeded by Benedict XIV.

CLEMENT XIII. (CARLO REZZONICO), born in Venice, 1693, succeeded Benedict XIV., 1758. The Jesuits having been expelled from France, Spain, Portugal, and Naples, he made great but useless efforts to reinstate them. In 1768 he lost Avignon and Benevento. He died in 1769. There is a splendid mausoleum to him in St. Peter's, executed by Canova, who was eight years employed on it. He was succeeded by

CLEMENT XIV. (GIOVANNI VINCENZO ANTONIO GANGANELLI), born in St. Arcangelo, 1705. Being of a conciliating disposition, he lived on good terms with all the European courts, and recovered Avignon and Benevento, which had been lost under the preceding pontiff. Pressed to decide the question of the abolition of the order of the Jesuits, he, in 1773, after temporizing for several years, issued the bull ordaining their suppression. He died in 1774, and was succeeded by Pius VI.

CLEMENT, JACQUES, the assassin of Henry III. of France; born in 1567, became a Dominican, and the fanatical tool of the Dukes of Mayenne and Aumale, and the Duchess Montpensier. Having fatally stabbed the king, he was at once killed by the courtiers; but the populace, instigated by the priests, regarded him as a martyr; and Pope Sixtus V. even pronounced his panegyric.

CLEOBULUS, one of the seven wise men of Greece, was a native of the Isle of Rhodes, and lived in the 6th century B. C.

CLEOMBROTUS, King of Sparta, gave battle, at Leuctra, to the Thebans, headed by Epaminondas, and was there killed, 371 B. C. This battle, when the Spartan army was almost entirely destroyed, put an end to the pre-eminence of Sparta in Greece.

CLEOMENES, the King of Sparta who assisted in the expulsion of Happias from Athens, and interfered in its domestic affairs in other respects, about the years 510, 508, and 504 B. C.

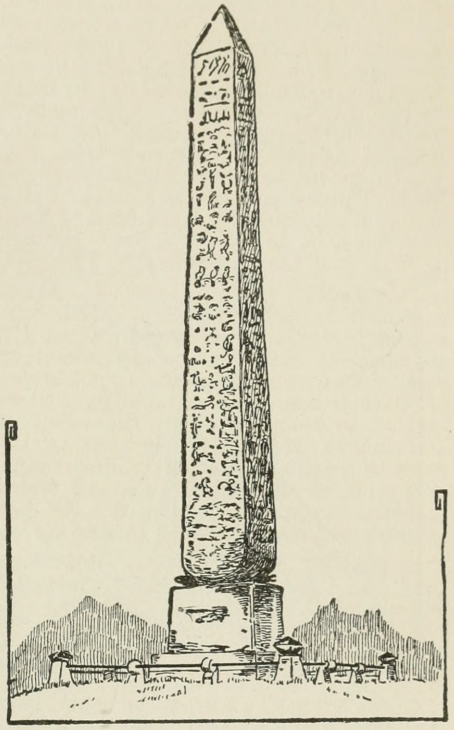
CLEOMENES, a Spartan king, who attempted to revive the constitution of Lycurgus. He was defeated by the Achæan League at Sellasia in 221 B. C., and killed himself soon afterward.

CLEON, an Athenian demagogue, originally a tanner by trade. He was well known in public before the death of Pericles, and in 427 B. C. distinguished himself by the proposal to put to death the adult males of the revolted Mytileneans and sell the women and children as slaves. In 425 he took Sphacteria from the Spartans; but in 423 and 422 he was violently attacked by Aristophanes in the Knights and in the Wasps. He was sent, however, in 422 against Brasidas, but allowed himself to be taken unawares, and was slain while attempting to flee.

CLEOPATRA, a Greek Queen of Egypt; born 69 B. C., the eldest daughter of Ptolemy Aulētēs. When she was 17 her father died, leaving her as joint-heir to the throne with his eldest son Ptolemy, whom she was to marry—such marriages being common among the Ptolemies. Being deprived of her part in the government (49 B. C.), she won Cæsar to her cause, and was reinstated by his influence. During a second disturbance Ptolemy lost his life, and Cæsar proclaimed Cleopatra Queen of Egypt; though she was compelled to take her brother, the younger Ptolemy, then 11 years old, as husband and colleague. Cæsar continued some time at Cleopatra's court, had a son by her named Cæsarion (afterward put to death by Augustus), and gave her a magnificent reception when she subsequently visited him at Rome. By poisoning her brother she remained sole possessor of the regal power, took the part of the triumvirs in the civil war at Rome, and after the battle of Phillippi sailed to join Antony at Tarsus. Their meeting was celebrated by splendid festivals; she accompanied him to Tyre, and was followed by him on her return to Egypt. After his conquest of Armenia he again returned to her and made his three sons by her, and also Cæsarion, kings.

On the commencement of the war between Augustus and Antony the latter lost a whole year in festivals and amusements with Cleopatra at Ephesus, Samos, and Athens, and when at last the fleets met at Actium, Cleopatra suddenly took to flight, with all her ships, and Antony, as if under the influence of frenzy, immediately followed her. They fled to Egypt, and declared to Augustus that if Egypt were left to Cleopatra's children they would thenceforth live in retirement. Augustus, however, demanded Antony's death and advanced on Alexandria. Believing Cleopatra, who had taken refuge in her mausoleum, to be treacherous and dead, Antony threw himself on his sword, and shortly afterward Cleopatra killed herself by applying an asp to her arm to escape the ignominy of being led in a Roman triumph (30 B. C.). With her the dynasty of the Ptolemies ended.

CLEOPATRA'S NEEDLES, two obelisks that were set up at the entrance of the Temple of the Sun, in Heliopolis, Egypt, by Thothmes III., about 1500 B. C. There are no means of knowing when they were built, or by whom, except from the inscriptions on them, which indicate the above time. The material of which they were cut is granite, brought from Syene, near the first cataract of the Nile. Two centuries after their erection Rameses II. had the stones nearly covered with carvings setting out his own greatness and achievements. About 14 B. C. the obelisks were moved from Heliopolis to Alexandria and set up in the Cæsarium. In 1819 one of these obelisks was presented by the Egyptian Government



CLEOPATRA'S NEEDLE, CENTRAL PARK, NEW YORK

to England, but as no one knew how to move them, it was not taken to London until 1878. Subsequently the other obelisk was presented to the United States, and is now in Central Park, New York City.

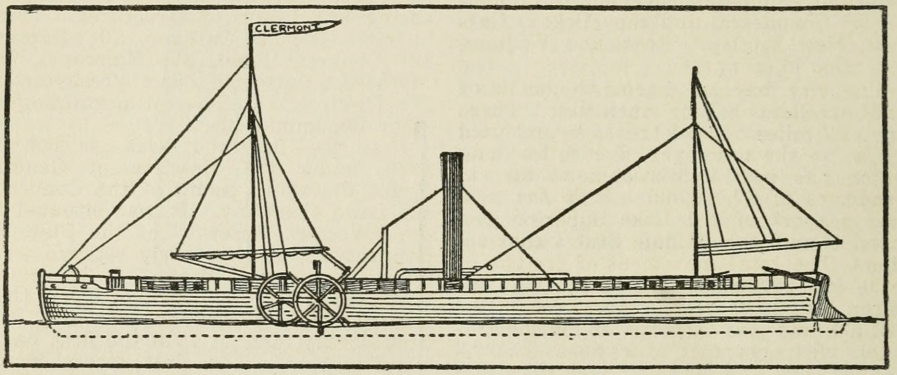
CLERGY, the body or order of men chosen or set apart to the service of God, in the Christian Church; in contradistinction to the lay worshipers, or laity. The term Secular Clergy is the designation of priests of the Roman Catholic Church who are not of any religious order, but have the care of parishes. Monks who are in holy orders are designated Regular Clergy.

CLERK, one who is employed in an office, store, etc., subject to a higher authority; a secretary, as, the Clerk of the House of Representatives or Senate; Clerks of the various courts, etc. In England a parish officer, a layman,

whose business used to be to lead the responses in the church services and to perform other duties connected with the parish; a parish Clerk.

CLERK-MAXWELL, JAMES, a Scotch physicist; born in Edinburgh, Nov. 13, 1831. He was a Professor of Natural Philosophy in Marischal College, Aberdeen, in 1856-1860; of Physics and Astronomy in King's College, London, in 1860-1865; and of Experimental Physics in the University of Cambridge in 1871. Among his most important works are: "Essay on the Stability of Motion of Saturn's Rings," "Theory of Heat," "Electricity and Magnetism," and "Matter and Motion." He died Nov. 5, 1879.

CLERMONT, THE, the name given by Robert Fulton to the steamboat in which he made his first trip from New York City to Albany in 1807.



THE "CLERMONT"

CLERMONT-FERRAND (klār-mōn'-fā-rän'), a town of France, capital of the department of Puy-de-Dôme; on a hill at the foot of the volcanic range in which the summit of the Puy is conspicuous. It possessed considerable importance under the Romans, and became a bishop's see at a very early period. It is an antique and gloomy town built of dark volcanic stone. The most remarkable edifices are the cathedral, a huge, irregular, gloomy pile, and the Church of Notre Dame, founded in 580. The manufactures are extensive, and the position of the town makes it an important center of trade. Pop. about 70,000.

CLERMONT-TONNERRE (klār-mōn'-tŏn-nār'), the name of a noble French family, of whom one of the most celebrated was Count Stanislas, born in 1747. At the breaking out of the Revolution of 1789 he endeavored to promote the establishment of a constitutional monarchy, founding with Malouet the Monarchical Club, and with Fontanes the Journal des Impartiaux. In 1791 he was charged with assisting the King in his attempt to escape, but was set free on swearing fidelity to the Assembly. In 1792, however, he was murdered by the mob at the house of the Countess de Brissac.

CLEVELAND, city, county-seat and port of entry of Cuyahoga co., O.; the first city in population and importance in Ohio. It is built on both sides of the Cuyahoga river at its mouth, on the S. shore of Lake Erie. The city has a harbor at the mouth of the river, giving safe anchorage for a large number of ships, secured by artificial breakwaters; for the coast, which here runs about N. E., is naturally an open one. Great breakwaters run out on each side of the river at its mouth, forming commodious E. and W. harbors. Pop. (1890) 261,353; (1900) 381,768; (1910) 560,663; (1920) 796,841.

The greater part of the city is on a plain elevated about 100 feet above the lake, and is laid out with much taste, especially the public squares and streets. The latter are wide and well paved, and an abundance of elms and other shade trees has given the city the name of "The Forest City." The two portions of the city are united by a stone viaduct, spanning the river and valley, completed in 1878, and having a length of 3,211 feet. Three more viaducts connect various parts of the city and form a belt elevated roadway.

The area of the city is 56.65 miles. There are 946 miles of streets and 834.3 miles of sewers. The Street Railway Company operates 412.71 miles of track. The city is served by seven railroad lines. There is a municipal electric lighting plant and 985 miles of water mains.

There is an excellent police force of 807 men, and the fire department has 604 employees.

There are several public parks, among them Gordon, of about 120 acres, on the lake shore; Wade, of 83 acres, on which $500,000 has been expended, making it one of the finest parks in the W. The total park and boulevard acreage exceeds 2,400 acres. The United States Building, including the Custom House, Postoffice and Federal Courts, occupy one building. The Federal Building is to be erected within a few years. The two County Court Houses, the City Hall, and Case Library Building, containing the Case Library, are notable structures. Other important buildings are those of the Western Reserve Historical Society, Western Reserve University, Case School of Applied Science, and the Chamber of Commerce, and the Hickox, Garfield, New England, Rose, and Williamson office buildings.

The city has an extensive commerce and excellent harbor facilities. There are 14.2 miles of lake frontage protected by a breakwater over five miles long which has been constructed at an expenditure of $7,000,000. It is the natural seaport of the Lake Superior iron district and the Middle States coal region. The total movement of freight in 1920 was 29,038,554 net tons. The imports for 1920 were valued at $10,812,369 and the exports at $6,859,935. Bank clearings for 1919 were $6,877,387,037.

The Federal census of 1914 placed the total value of goods manufactured in Cleveland at $342,418,052. The capital invested in 1920 was $352,531,109. The number of industrial establishments was 2,346, and the salaries and wages paid amounted to $92,909,888. The principal products are steel, iron, foundry and machine-shop products, meat packing, clothing, paint and varnish, stoves and furnaces, printing and publishing, electrical machinery, tobacco manufactures, cutlery and tools, furniture and refrigerators, bread and patent medicines.

Cleveland ranks as one of the most important lake ports. In the fiscal year 1920 the imports of merchandise aggregated in value $18,628,926, and the exports $27,993,181.

Finances.—In 1919 the net funded debt of the city was $55,068,850. The total realty assessed valuation in 1920 was $1,073,842,860. The total personally assessed valuation for 1920 was $679,403,330. The tax rate was .70. The budget for the year was $6,347,200.

On Oct. 6, 1900, there were 16 National banks in operation. The exchanges at the United States Clearing-house in the year ending Sept. 30, 1919, aggregated $5,104,301,000.

Education.—Marked attention is given to public instruction. There are 127 public elementary schools, with 3,665 teachers and 95,582 pupils, fourteen public high schools, nine junior high schools, and ten parochial high schools. For higher education there are the Western Reserve University, the Case School of Applied Science, Saint Ignatius College, Cleveland College of Law, and numerous art, music, and commercial schools. Cleveland was the first city west of the Allegheny Mountains to establish a free high school, on July 13, 1846. The library contains over 600,000 volumes, and has numerous branches.

Churches.—The city contains 425 churches, many of them housed in imposing and beautiful structures. These include: Roman Catholic, 70; Baptist, 32; Congregational, 31; Episcopal, 25; Methodist-Episcopal, 53; Presbyterian, 27; Disciple, 11; the rest pertaining to other denominations.

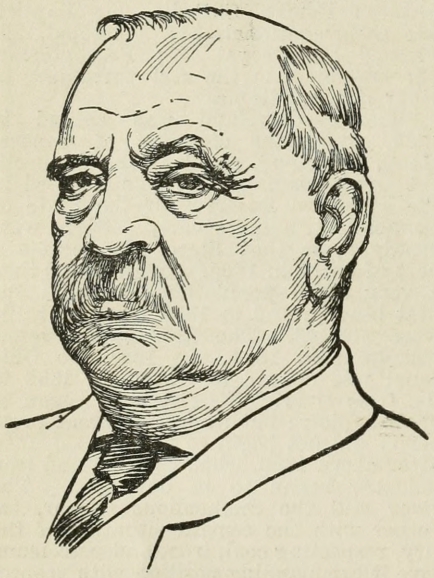
History.—Cleveland was settled in 1796, under the direction of General Moses Cleveland, agent of the Connecticut Land Company. It was situated in the "Western Reserve" of the State of Connecticut, and its early settlers were mostly from that State. It became a port of entry in 1805, though it had then a very small population. In 1811 the first library, and in 1816 the first bank, were started. The first steam vessel was built in 1824. In 1827 the Ohio canal was opened to Akron, in 1832 to the Ohio river. The city then began to grow rapidly; but its era of great prosperity did not begin to be attained until after about 1860, when the coal and iron industry began to be developed. The river and the commodious harbor, together with the central situation of the city, respecting coal, iron, and petroleum, give it commanding position with respect to trade.

CLEVELAND, a city of Tennessee, the county-seat of Bradley co. It is on the Southern railroad. Its industries include woolen and flour mills, stove works, hosiery mills, lumber mills, etc. It is the seat of the Centenary Female College. Pop. (1910) 5,549; (1920) 6,522.

CLEVELAND, FREDERICK ALBERT, an American economist; born in Sterling, Ill., March 17, 1865. He graduated from De Pauw University in 1890. Intending at first to practice law, he soon abandoned that field for economics, pursuing special studies in that subject at the Universities of Chicago and Pennsylvania. He was professor of finance at

the School of Commerce, New York University 1903-1905. In 1907 he became director of the Bureau of Municipal Research. Among his publications are: "Funds and Their Uses" (1902); "The Bank and the Treasury" (1905); "Railroad Finance" (1912), in collaboration with F. W. Powell; "Organized Democracy" (1913); etc.

CLEVELAND, GROVER, an American statesman; twice President of the United States; born in Caldwell, Essex co., N. J., March 18, 1837; son of a Presbyterian clergyman. He studied law, settled in Buffalo, and in 1863 became assistant district attorney of Erie county, N. Y. After becoming in succession sheriff and mayor of Buffalo, he was chosen governor of New York in 1882. In 1884 he received the Democratic nomination for the Presidency, and was



GROVER CLEVELAND

elected, defeating James G. Blaine. He was renominated in June, 1888, but was defeated by Benjamin Harrison, Nov. 6 following. After a successful law practice of four years he was again nominated by the Democratic National Convention of 1892, in spite of the opposition of the delegation from his own State, and elected by very large majorities. Some of the measures of his administration were: The settlement of the Venezuelan boundary question with Great Britain; the consolidating of postoffices in large centers so as to increase the scope of the civil-service rules; and most notably the conclusion in January, 1897, of a general arbitration treaty with Great Britain, which, however, was rejected by the Senate. Possessed of great independence of character and persistence in carrying out policies once determined upon, he often aroused criticism and hostility in the ranks of his own party. On the other hand, these qualities won him admiration in many quarters. During 1896-1897 he maintained an attitude of friendliness for Spain in the midst of great popular clamor in behalf of the Cuban cause, offering the friendly services of the United States in his last annual message, in composing the differences between Spain and Cuba on a basis of home rule. After his retirement from the Presidency he lived at Princeton, N. J. He was made a trustee of Princeton University, where he lectured at times. Some of his lectures formed the basis of his book, "Presidential Problems" (1904). He died June 24, 1908.

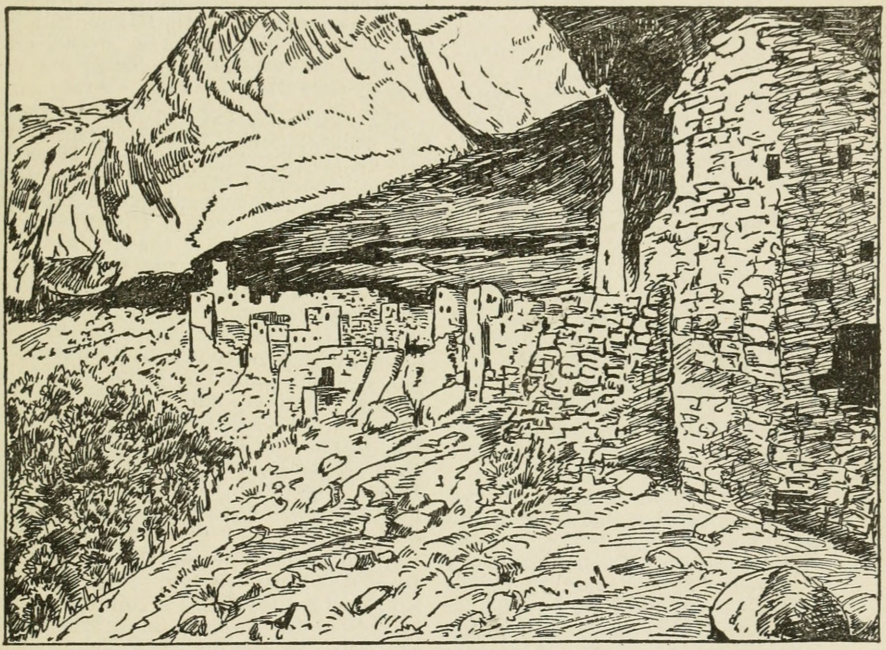
CLEVELAND HEIGHTS, a city of Ohio, in Cuyahoga co. It is a suburb of Cleveland. Pop. (1910) 2,955; (1920) 15,236.

CLEWS, HENRY, an American financier; born in Staffordshire, England, Aug. 14, 1840; studied for the ministry, but left school to embark on a mercantile career in New York, where his father had taken him on a visit. At the outbreak of the Civil War he was appointed by Secretary of the Treasury Chase government financial agent to continue the sale of bond issues to finance the war. In 1877 he organized and has since been the head of the firm of Henry Clews & Co. In recognition of his service during the war, he was chosen by President Grant fiscal agent of the United States for all foreign nations. He twice declined the portfolio of Secretary of the Treasury. Among other works he wrote "Twenty-eight Years in Wall Street" (1885); "The Wall Street Point of View" (1900); "Speeches and Essays" (1910).

CLICHÉ (klē-shā), an electrotype or a stereotype cast from an engraving, especially from a wood-cut.

CLIFF DWELLERS, a race of Indians who lived in the cliffs bordering on the valleys of the Rio Grande and Rio Colorado. Their homes were built in the recesses of these cliffs at a height often of several hundred feet from the ground, and at the present time seemingly inaccessible, as the former paths that led to them have nearly all been destroyed by the crumbling away of the rocks. These dwellings sometimes consisted of many rooms, and in some cases were two or more stories high, hewn in the rock, with

wooden lintels in the doors and windows, which were probably closed with skins or blankets. The walls were finished with a plaster of clay. The inhabitants subsisted probably mainly by hunting and fish, as the soil about these localities is barren. The Pueblo Indians, who are still to be found in that section, are descendants of the Cliff Dwellers, and possess considerable skill in making articles of pottery, etc.



CLIFF DWELLING, MESA VERDE

CLIFTON, a city of New Jersey in Passaic co., on the Erie and the Delaware, Lackawanna and Western railroads. It is an important industrial city, having large cotton and worsted mills, and is also the center of an important agricultural and horticultural region. It has electricity for power and lighting, an abundant supply of water power, and many handsome business buildings. Pop. (1910) 11,869; (1920) 26,470.

CLIFTON FORGE, a city of Virginia, in Allegheny co. It is on the Chesapeake and Ohio railroad. Its industries include railway shops, flour mills, and machine works. In the neighborhood are deposits of iron ore and limestone. Pop. (1910) 5,748; (1920) 6,164.

CLIMATE, in its most general acceptation, embraces all those modifications of the atmosphere by which our organs are sensibly affected; such as temperature, humidity, variations of barometric pressure, the tranquillity of the atmosphere or the effects of winds, the purity of the air, or its mixture with gaseous emanations more or less salubrious; and lastly, the habitual diaphanity of the atmosphere, that serenity of the sky so important on account of the influence which it exercises not only on the development of organic tissues in vegetables and the ripening of fruits, but also on the ensemble of moral sensations which mankind experience in the different zones. There are two general causes on which the climate peculiar to any country principally depends: First, its distance from the equator; second, its altitude above the level of the sea; but their effect is generally modified by many circumstances exerting a partial influence. Among these may be enumerated the configuration and extent of the country; its inclination and local exposure; the direction of the chains of mountains by which it is intersected, or which are in its vicinity; the nature of the soil as it is more or less favorable to radiation, absorption, and evaporation; the proximity to, or distance from, seas; the action of winds blending the temperatures of different latitudes; and even the changes produced by cultivation. The appreciation of all these causes, which modify the results deduced from the consideration of

latitude and elevation alone, and the effect produced by their combined operation, constitutes the science of Climatology.

CLINTON, a city and county-seat of Clinton co., Ia.; on the Mississippi river, and the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul, and other railroads; 60 miles S. E. of Dubuque. It is the trade center for a region of 50 miles radius, and has large manufacturing interests. The Mississippi is crossed at this point by several bridges. The city has Wartburg College (Lutheran, 1894), public schools, several churches, daily and weekly newspapers, electric lights, and railways, three National banks, etc. Pop. (1910) 25,577; (1920) 24,151.

CLINTON, a town in Worcester co., Mass.; on the Nashua river, and the Boston and Maine and the New York, New Haven and Hartford railroads; 40 miles W. of Boston. It has important cotton and carpet manufactories, furnished with excellent power from the river; is connected with neighboring towns by electric street railroads; and has numerous churches, daily newspapers, electric lights, public library, high and graded public schools, a National bank, etc. Pop. (1910) 13,075; (1920) 12,979.

CLINTON, DE WITT, an American lawyer and statesman; born in Little Britain, N. Y., March 2, 1769. He was United States Senator from New York (1802); mayor of New York City (1803-1807, 1809-1810, 1811-1815); lieutenant-governor (1811-1813); candidate for President (1812); governor (1817-1823, 1825-1828). He was the chief originator of the Erie Canal (1817-1825). Besides purely political works, addresses, etc., he wrote: "Antiquities of Western New York," "Natural History and Internal Resources of New York," etc. He died in Albany, N. Y., Feb. 11, 1828.

CLINTON, GEORGE, Vice-President of the United States; born in Little Britain, Ulster co., N. Y., July 26, 1739. He served as lieutenant under his brother James at the capture of Frontenac, but afterward studied law. He was a member of Congress in 1776, and voted for the Declaration of Independence, but was summoned to the army as brigadier-general before it was prepared for signature. In 1777 he was elected governor and at the same time lieutenant-governor of the State of New York, which latter office was, on his acceptance of the other, conferred upon Mr. Van Courtlandt. He held the office of governor during the next 18 years, for which eventful period the history of his life is that of the State. He was again chosen governor after spending five years in private life, in 1801, and in 1804 became Vice-President of the United States. He died in Washington, D. C., April 20, 1812.

CLINTON, SIR HENRY, a British general, born about 1738; served in the Hanoverian war, and was sent in 1775, with the rank of major-general, to America, where he distinguished himself in the Battle of Bunker Hill. He defeated the Americans at Long Island, but had to evacuate Philadelphia to Washington. In 1782 he returned to England. He died in Gibraltar, Dec. 23, 1795.

CLINTON, JAMES, an American military officer; born in Little Britain, Ulster co., N. Y., Aug. 9, 1736. With his father he served at Frontenac, in 1758, as captain, and commanded in 1763 the forces raised to protect Ulster and Orange counties against the Indians. He accompanied Montgomery to Quebec in 1775, and was appointed brigadier-general the following year. While his brother George was governor of New York, he was overpowered at Fort Clinton by the superior force under Sir Henry Clinton, and being severely wounded narrowly escaped with his life. He afterward served against the Indians under Sullivan, in 1779, and was present at the surrender of Cornwallis. After the peace he occupied many distinguished civil stations. He died Dec. 22, 1812.

CLIO, glory, renown, the muse of history and epic poetry, represented as bearing a half-opened roll of a book. Daughter of Jupiter and Mnemosyne, she was the mother of Hyacinthus and Hymenæus. There was also a sea nymph, Clio, daughter of Oceanus and sister of Beroe, who figures in Greek mythology.

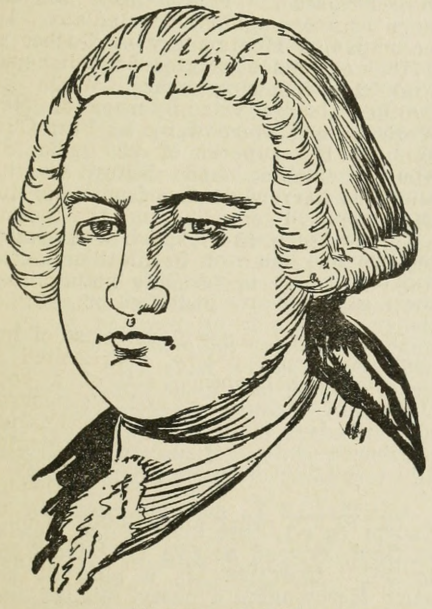
CLIPPER, a name familiarly given to a ship built expressly for speed. A Clipper, as compared with an ordinary sailing ship, was longer and narrower; very sharp at the bows, which were generally hollowed more or less below the water-line; gracefully fined away toward the stern, which was usually elliptical; and altogether presenting the contrast of the race-horse to the beast of burden. Clipper ships were extensively employed in the South American, California, and China trade.

CLISTHENES, an Athenian law-giver, who established a popular constitution after the expulsion of Hippias, in 509 B. C.

CLITUS, a distinguished Macedonian general, who saved the life of Alexander the Great at the battle of Granicus, but

who, having expostulated with his imperial master when the latter was in a fit of intoxication, was slain by him, B. C. 328.

CLIVE, ROBERT, Lord Clive and Baron of Plassey, an English general and statesman; born in Shropshire, Sept. 29, 1725. In his 19th year he entered the East India Company's service at Madras as a writer, but in 1747 quitted the civil for the military service. The French under Dupleix had recently gained important privileges and large grants of territory, and in alliance with Chunda Sahib, Nabob of Arcot, were threatening the existence of the British establishments. In 1751 Clive, who had already a reputation for skill and courage, marched on the large city of Arcot with 200 British troops and 300 Sepoys, and took it, though strongly garrisoned, with-



ROBERT CLIVE

out a blow; withstood a siege by Chunda Sahib for nearly two months; and at last routed the enemy, took possession of important posts, and returned to Madras completely victorious. In 1753 he sailed to England to recover his health, and was received with much honor.

Two years later he was back in India, in his governorship of St. David's, from which he was soon summoned to command the expedition sent to Bengal, where the Nabob Suraj-ud-Dowlah had attacked the British, destroyed their factories, taken Calcutta, and suffocated over 120 of his prisoners in the Black Hole. Clive soon took possession of Calcutta and brought Suraj-ud-Dowlah to terms; but having no trust in the loyal intentions of the nabob he resolved to dethrone him. With the help of Meer Jaffier, one of the nabob's officers, he effected his purpose, and in the battle of Plassey completely overthrew Suraj-ud-Dowlah's forces. Meer Jaffier now became the new nabob, and Clive was made Governor of Calcutta. Here he was equally successful against the encroachments of the Dutch, defeating their forces both by sea and land.

Clive now visited England again, where his success was highly applauded without much inquiry as to the means; and in 1761 he was raised to the Irish peerage, with the title of Lord Clive, Baron of Plassey. In 1764 fresh troubles in India took him back, but now as President of Bengal, with command of the troops there. Before his arrival, however, Major Adams had already defeated the Nabob of Oude, and Lord Clive had only the arranging of the treaty by which the company obtained the disposal of all the revenues of Bengal, Bahar, and Orissa. In 1767 he finally returned to England. In 1773 a motion was made in the House of Commons, that "Lord Clive had abused the powers with which he was intrusted"; but it was rejected for a resolution that "Lord Clive had rendered great and meritorious services to his country." His health was by this time broken, and in one of his habitual fits of melancholy he put an end to his life, Nov. 22, 1774.

CLOACA, a sewer, an underground drain or conduit. The Roman Cloaca Maxima (the greatest or main sewer) is said to have been constructed, or at least begun under the auspices of King Tarquinius Priscus, about B. C. 588.

CLOCK, an instrument for measuring and indicating the time of day. From the earliest periods of human history man has sought to measure time. To pastoral or agricultural nations where the duties of each day were monotonous and bounded by the four great divisions of sunrise, midday, sunset, and midnight, extreme accuracy was not important. The first measure of time was the sun-dial, but this being of no service at night or on cloudy days, the hour-glass was invented, next the clepsydra, subsequently improved by the addition of a toothed wheel and index or sort of dial driven by the water which flowed from the bottom of the jar. These have been in use 2,000 years. The next improvement was the substitution of a weight for the water to turn the wheel. This has been attributed to Archimedes. Some contrivance was

necessary to regulate the weight so as to make the index pass over equal spaces in equal times. This must be accomplished by a pendulum or escapement of some kind, and a rude escapement is attributed to Gerbert, about A. D. 1000. A better one was that of De Vick in 1379.

Accuracy in marking time was not attained, however, by this, though it was a great improvement. For 270 years there was no advance, but between 1641 and 1658 the idea of attaching the pallets of the escapement to the pendulum-rod and making the escapement horizontal occurred both to Harris, an English clockmaker, and Huyghens, a Dutch philosopher. The anchor escapement of Dr. Hooke, invented in 1666-1680, and the dead-beat escapement of Graham in 1700, gave a new impulse to clockmaking. There has been no material change in the principles on which clocks are made, except in the substitution of steel springs for weights and in the finer movements, and in the addition of the hairspring to regulate still further the action of the escapement or pendulum, since 1700. There have been a great variety of escapements invented and much more attention paid to accuracy in the details and perfection of finish, but the principles are the same.

Considered as scientific instruments for the precise measurement of time, they may be divided into two classes according to the character of the compensation of their pendulums, whether of the gridiron type or the mercurial pendulum. The first keeps a constant length of the pendulum-rod by the difference of expansion of different metals with change of temperature, and the other makes up for the lengthening of the rod with rise of temperature by the greater expansion of a jar of mercury carried on the bed-plate of the pendulum, the rise in the center of gravity of this counterbalancing the lengthening of the sustaining rod. Clocks differ in another important particular, that of the escapement, whose function it is to be unlocked at each oscillation of the pendulum and thus allow the train of wheels to move forward a step, and also to transmit an impulse to the pendulum just sufficient to counterbalance the friction caused by the unlocking of the escapement. In fine astronomical clocks either the Graham dead-beat or some form of gravity escapement is the one most generally used. In any of them the object to be attained is to make the work of unlocking and the impulse given to the pendulum to make up for it as nearly absolutely constant as possible. If this is not done the arc of vibration of the pendulum will vary, and with it the steady rate of the clock.

The manufacture of clocks in America began about 1800 in Connecticut, which is still the center of the industry in the United States.

CLŒLIA, a girl of Rome, who, the legends say, having been given up to Porsena as a hostage, escaped to Rome by swimming the Tiber.

CLOQUET, a city of Minnesota, in Carlton co. It is on the Northern Pacific, the Great Northern, the Chicago, Milwaukee and St. Paul, and the Duluth and Northeastern railroads, and on the St. Louis river. It is the center of an extensive lumber region and has manufactures of print paper, boxes, and match blocks. Pop. (1910) 7,031; (1920) 5,127.

CLOSURE, a rule in British parliamentary procedure adopted in 1887 by which, at any time after a question has been proposed, a motion may be made with the speaker's or chairman's consent "That the question be now put," when the motion is immediately put and decided without debate or amendment. The motion must be supported by more than 100 members and opposed by less than 40, or have the support of 200 members. The introduction of the Closure was intended to prevent debates from being too much spun out.

In the Congress of the United States the practice has been to allow unlimited debate, and it is for this reason that there are so many instances of obstructionary tactics being resorted to by a minority to delay the passage of a measure. These tactics have been given the general name of "filibustering," and include almost every expedient known to parliamentary tacticians. A call for "the previous question," if sustained, will usually terminate discussion immediately.

CLOTAIRE I., son and successor of CLOVIS (*q. v.*), first king of the Franks in Gaul, reigned as sole king from 558 to 561. CLOTAIRE II., a king of the same Merovingian dynasty, reigned over the Franks 30 years later.

CLOTH, a manufactured substance consisting of wool, hair, cotton, flax, and hemp, or other vegetable filaments. It is formed by weaving or interlacing threads, and is used for making garments or other coverings. The term Cloth, when used alone, is generally employed to distinguish woolen Cloth from fabrics made of any other textile material. See WEAVING.

CLOTHING, the clothes or dress, that is, the artificial coverings collectively, which people wear. Nothing is more necessary to comfort than that the body should be kept in nearly a uniform tem-

perature, thus preventing the disturbance of the important excretory functions of the skin by the influence of heat or cold. Hence in a changeable climate the question of Clothing becomes of special importance. The chief end proposed by Clothing ought to be protection from the cold. A degree of cold amounting to shivering cannot be felt without injury to the health, and the strongest constitution cannot resist the benumbing influence of a sensation of cold constantly present, even though it be so moderate as not to occasion immediate complaint, or to induce the sufferer to seek protection from it. This degree of cold often lays the foundation of the whole host of chronic diseases, foremost among which are found scrofula and consumption.

The only kind of dress that can afford the protection required by the changes of temperature to which the cooler or temperate climates are liable is woolen. Those who would receive the advantage which the wearing of woolen is capable of affording must wear it next the skin; for it is in this situation only that its health-preserving power can be felt. The great advantages of woolen cloth are briefly these:—the readiness with which it allows the escape of sweat through its texture; its power of preserving the sensation of warmth to the skin under all circumstances; the slowness with which it conducts heat; the softness, lightness, and pliancy of its texture. Cotton cloth, though it differs but little from linen, approaches nearer to the nature of woolen, and on that account must be esteemed as the next best substance of which Clothing may be made. Silk is the next in point of excellence, but it is very inferior to cotton in every respect. Linen possesses the contrary of most of the properties enumerated as excellencies in woolen. It retains the matter of perspiration in its texture, and speedily becomes imbued with it; it gives an unpleasant sensation of cold to the skin; it is very readily saturated with moisture, and it conducts heat too rapidly.

Clothes should be so made as to allow the body the full exercise of all its motions. The neglect of this precaution is productive of more mischief than is generally believed.

CLOTHO, one of the three Fates or Destinies who are represented by the ancient classical writers as spinning the thread of life. Clotho held the distaff, Lachesis spun the thread of life, Atropos cut the thread when the man was to die.

CLOTILDA, ST., the daughter of Chilperic, King of Burgundy; born in 475, and in 493 became wife of Clovis, King of the Franks. She was the chief means of securing the conversion of her husband to Christianity, and largely influenced his life. After his death she lived a life of austerity at Tours, where she died in 545. She was canonized a few years after. Her remains were buried in the church of St. Geneviève at Paris, and burnt at the Revolution to prevent their desecration; the ashes are still in the church of St. Leu.

CLOUDS, formations owing their origin to aqueous vapor diffused in the atmosphere. The vapor is supplied from the evaporation of the sea and other water surfaces, under the influence of solar heat, and is diffused through the agency of winds. Air—under a given pressure and temperature—can absorb, or hold, only a certain amount of invisible vapor; when charged with this maximum amount it is said to be saturated. Should the temperature, under this condition, be lowered, as, for instance, when a current is ascending into colder regions, or expanding, condensation takes place, and clouds are formed, appearing suspended at a certain level above the surface. Should the cooling continue, these globules unite and are finely precipitated in the form of rain, and, with sufficiently reduced temperature, as snow, or perhaps hail or sleet. Mists and fogs are simply incipient states of clouds, and when in contact with cold bodies produce, by deposition of moisture, dew, and hoar-frost. The whole subject is comprised under the name hygrometry. The forms of clouds have been observed to depend greatly on altitude, and have been classified accordingly.

The nomenclature proposed by Howard, at the beginning of the 19th century, is still generally adhered to, owing to its simplicity and appropriateness, though a few minor subdivisions have been added. He divides clouds into three primary modifications, named *cumulus*, *stratus*, and *cirrus*, with the intermediate composite forms—*cumulo-stratus*, *cirro-stratus*, *cirro-cumulus*, and, lastly, *nimbus*, or rain-cloud. These varieties, and the conditions accompanying them, may be briefly described as follows: *Cumulus*—Convex or conical masses, generally resting on a horizontal base of apparently dense structure, and of globular shape or rolls (so-called cotton bale); they form in the lower atmosphere under the influence of ascending heated air, and are most developed during the hottest part of the day; a fair-weather cloud. *Stratus*—Consists of continuous horizontal sheets, a fine-weather sign, appearing mostly during the night and at no great elevation. It forms dense clouds when mixed with smoke or dust. *Cirrus*—A lofty

cloud of loose or fibrous structure, feathery in appearance and of great variety—said to have been seen at an altitude of 10 miles. Its particles are supposed to be frozen and crystallized, which give rise to halos, coronæ, and other optical appearances. Cirrus is said to be often the precursor of windy weather or changes. Their movement is generally different from that of the lower clouds. *Cumulo-stratus*—A modification of cumulus; flat-topped, mushroom-shaped masses; have a tendency to spread and overcast the sky, and indicate coming rainy weather. *Cirro-stratus*—A fibrous cirrus cloud in close horizontal arrangement. Sky mottled with these clouds is known as mackerel sky. Often precedes wind and rain. *Cirro-cumulus*—Small, round masses, disposed with more or less regularity; usually a high level cloud, though below that of cirrus. They appear most frequently in dry and warm weather. *Nimbus*—A low cloud, from which rain is falling, the masses so blended together as to form no definite outline. *Scud*—A term referring to low, detached clouds, drifting rapidly before the wind.

Precipitation, or rain, is one of the most irregular of all meteorological phenomena, there being places of habitual dryness throughout the year with but occasional sprinklings. Tropical countries generally have a dry and a wet season, and there are other localities where rain may fall irregularly at all seasons. There are places where the annual rain-fall amounts to several hundred inches. Fifty inches per annum may be regarded as a moderate rain-fall, and below 20 inches a very light one, and generally insufficient for agricultural purposes unless it should fall in the right season.

The study of clouds and their movements has, in recent years, been greatly extended through international agreements and co-operation. The development of aeronautics has greatly advanced our knowledge regarding clouds and, on the other hand, has made more accurate and extensive knowledge regarding them a matter of practical necessity rather than theoretical interest.

CLOUD, ST., a town of France, in the department of Seine-et-Oise, a few miles from and S. W. of Paris. The historical associations of this place are intimately connected with the royalty of France. Its palace, which is very beautiful, was originally the property of the Dukes of Orleans, and, for a long period, was a summer residence of the kings of France. Its fountains are extremely elegant, and its park extensive. Here, in 1799, Napoleon I. dismissed the Assembly of Five Hundred, and caused himself to be proclaimed first consul; and here, in 1830, Charles X. put his signature to the ordinances which cost him his throne.

CLOUGH, ARTHUR HUGH (klöf), an English poet; born in Liverpool, Jan. 1, 1819. He studied under Dr. Arnold at Rugby, and then at Oxford, where he highly distinguished himself. On his return from a tour in the United States (1852) he was appointed an examiner attached to the educational branch of the privy-council office. He died in Florence, Nov. 13, 1861, while returning from a journey to Greece. His poems, of which the best known are "Bothie of Tober-na-Vuolich," "Amours de Voyage," and the "Tragedy of Dipsychus," were published, with a memoir, by F. T. Palgrave, in 1862.

CLOVES, a very pungent aromatic spice, the dried flower-buds of *Caryophyllus aromaticus*, a native of the Molucca Islands, belonging to the myrtle tribe, now cultivated in Sumatra, Mauritius, Malacca, Jamaica, etc. The tree is a handsome evergreen from 15 to 30 feet high, with large elliptic smooth leaves and numerous purplish flowers on jointed stalks. Every part of the plant abounds in the volatile oil for which the flower-buds are prized. The spice yields a very fragrant odor, and has a bitterish, pungent, and warm taste. It is sometimes employed as a hot and stimulating medicine, but is more frequently used in culinary preparations.

CLOVIS I., King of the Franks, usually called the founder of the French monarchy; born in 466. He was the son of Childeric I., and succeeded him in 481. During his reign he recovered from the Romans all their possessions in Gaul. He defeated Siagrius, near Soissons, in 486, compelled Alaric, King of the Visigoths, to surrender himself, and had him put to death. Clovis I. married CLOTILDA (*q. v.*), niece of Gundebald, King of the Burgundians, and through her influence was gradually led to renounce paganism, and profess Christianity. His final decision was made after his great victory over the Alemanni, at Tolbiac, in 496; and he was baptized by St. Remi, with 3,000 of his subjects. Clovis I. pursued a crafty policy with the King of the Burgundians and his brother, on the principle "divide and conquer." In 507 he made war on Alaric II., King of the Visigoths, and totally defeated him at the battle of Vouglé, killing him with his own hand. Clovis I. thus added the whole S. W. part of Gaul to his dominions. At Tours he soon afterward received ambassadors from Anastasius, Emperor of the East, who gave him the

titles of patrician and consul. Clovis I., about that time, settled at Paris, and made it the capital city. He disgraced himself by the unjust and cruel measures he took to get rid of several of his kindred, possible competitors for the crown. He died in Paris, in 511, after dividing his kingdom between his four sons.

CLOVIS II., second son of Dagobert, King of Neustria and Burgundy, whom he succeeded in 638. He died in 655.

CLOVIS III., son of Thierry III., King of France, whom he succeeded in 691, at the age of nine, and reigned five years, under the guardianship of Pepin d'Heristal, mayor of the palace. He died in 695.

CLOWES, WILLIAM LAIRD, an English naval critic and miscellaneous writer; born in London, Feb. 1, 1856. He was educated at King's College, London; and from 1876 to 1895 was correspondent for various newspapers. He wrote much on naval development and on art and sociology. He died Aug. 14, 1905.

CLUB, an association or number of persons combined for the promotion of some common object, whether political, social, or otherwise. The earliest London Club of any celebrity was established about the beginning of the 17th century, at the Mermaid Tavern, Friday street. Among its members were Shakespeare, Sir Walter Raleigh, Beaumont, Fletcher, and Selden. Ben Jonson figured at another club, which met at the Devil Tavern, near Temple Bar. Of other Clubs, the literary one, established in the year 1764, had among its members Johnson, Boswell, Burke, and Goldsmith. Toward the close of the 18th century, the French political Clubs gained world-wide notoriety from the active part which they took in the first French revolution. The most celebrated was the Jacobin Club, founded at Versailles in 1789, and called originally the Breton Club. This and other political French Clubs were abolished on Sept. 4, 1797. They were revived in 1848, but were suppressed again in 1849 and 1850.

Well-appointed Clubs for men, in the English style have been established in all the leading cities of the United States, and within recent years Clubs exclusively for women have become numerous and popular.

CLUGNY, or CLUNI (klön'yē) (ancient *Cluniacum*), a town of France in the department of Saône-et-Loire, on the Grône, 46 miles N. of Lyons. There are seen the ruins of a celebrated abbey. The monks of the Order of Clugny were the first branch of the order of Benedictines, and took their name from the above town, where they were first established. The Benedictines having become very lax in their discipline, St. Odo, abbot of Clugny, in 927, not only insisted on a rigorous observance of the rules by the monks under him, but likewise introduced new ceremonies of a severer nature. These new rules soon came to be observed in the principal monasteries in France, Spain, Italy, Germany, and Britain; and by the 12th century the order numbered about 1,000 cloisters in different parts of Europe. The order was abolished in France in 1790. Pop. about 4,000.

CLYDE (klīd), a river of Scotland, which has its sources amid the hills that separate Lanarkshire from the counties of Peebles and Dumfries, passes by Lanark, Hamilton, Glasgow, Renfrew, Dumbarton, Greenock, etc., and forms finally an extensive estuary or firth before it enters the Irish Sea, at the southern extremity of the island of Bute. From its source to Glasgow, where navigation begins, its length is about 80 miles. Its principal tributaries are the Douglas Water, the Mouse, the Nethan, the Avon, the Calder, the North Calder, the Kelvin, the White and Black Cart, and the Leven. Near Lanark it has three celebrated falls—the uppermost, Bonniton Linn, about 30 feet high; the next, Cora Linn, where the water takes three distinct leaps, each about as high; and the lowest, Stonebyres, also three distinct falls, altogether about 80 feet. The Clyde, by artificial deepening, has been made navigable for large vessels up to Glasgow, and is the most valuable river in Scotland for commerce.

CLYDE, LORD. See CAMPBELL, SIR COLIN.

CLYMENE, the daughter of Oceanus, and mother of Atlas and Prometheus.

CLYMER, GEORGE, an American patriot; born in Philadelphia, in 1739. He entered mercantile life when a lad and acquired a competence. He was prominent in public affairs prior to the Revolution, and in 1775 became one of the first Continental treasurers. He was chosen in 1776 to succeed a member of the Continental Congress who had refused to sign the Declaration of Independence, to which he promptly affixed his signature, although not on the 4th of July. He was active in the patriot cause during the Revolution, and in 1787 was a member of the convention that framed the Constitution of the United States and a member of the First Congress of

the United States. He died in Moinsville, Pa., Jan. 23, 1813.

CLYNES, JOHN ROBERT, a British Labor leader; born at Oldham, England, in 1869. He represented the Labor party in Parliament beginning with 1906. In 1918 he was appointed Food Controller. He was President of the National Union of General Workers and Chairman of the Executive Council.

CLYSTER, an antiquated term for enema.

CLYTEMNESTRA, in Greek mythology, daughter of King Tyndareus and Leda, and half-sister of Helen. During the absence of Agamemnon in the war against Troy she bestowed her favors on Ægisthus, and, in connection with him, murdered Agamemnon on his return from Troy, and, together with her paramour, governed Mycenæ for seven years. Her son Orestes killed them both.

COADJUTOR, a Latin term, nearly synonymous in its original meaning with assistant. The term is especially applied to an assistant bishop appointed to act for and succeed one who is too old or infirm for duty.

COAGULATION, the act or process of being coagulated, or of changing from a liquid to a curd-like semi-solid state, produced without evaporation and without crystallization. It differs from congestion in not being attended by a fall of temperature in the substance coagulated.

When blood is drawn and allowed to stand it emits a "halitus" or exhalation, which has a faint smell. In three or four minutes a film overspreads the liquid, commencing at the circumference and gradually spreading to the center. Two or three minutes later the lower part of the blood, in contact with the vessel, becomes solidified, and then the whole mass, only about eight or nine minutes being needful for the whole process from first to last. In about 15 or 20 minutes a thin serum begins to exude from it, and goes on to do so for two or three days.

COAHUILA (kō-ā-wē'lä), a State of Mexico, separated from Texas by the Rio Grande, has an area of 63,786 square miles, partly mountainous, and forming in the W. a part of the wilderness of the Bolson de Mapimi. The climate is healthy, though extremes of heat and cold are usual. The State is rich in minerals, especially silver, and coal has been found. It has valuable pasturage, and in many parts a most fertile soil. The Mexican International railway, traversing the State from N. to S., has contributed much in recent years to the development of its resources; several cotton-factories and a large number of flour-mills are in operation. Pop. about 400,000; capital, Saltillo (pop. about 40,000).

COAL, a solid mineralized vegetable matter that can be used for fuel. In the sense of a piece of glowing fuel, thence a piece of fuel, whether dead or alive, the word is common to all languages of the Gothic stock, and seems allied to the Latin *caleo*, to be hot, and is allied to glow and kiln. The different sorts of fuel are distinguished by prefixes, as char-Coal, pit-Coal, sea-Coal, but, owing to the eminent importance of mineral or pit-Coal, the word Coal alone has come to be used in this special signification. Coal is one of the most important of all minerals; it consists chiefly of carbon, and is universally regarded as of vegetable origin. It occurs generally in strata or beds; it is always of black or blackish-brown color; some of the varieties have considerable vitreous or resinous luster; some are destitute of luster; some have a shell-like fracture, and some have a sort of salty structure, and are readily broken into cubical or rhomboidal fragments. In a general way we may define Coal as a fossil fuel of a black color and stony consistency, which, when heated in close vessels, is converted into coke with the escape of volatile liquids and gases. The variety known in Great Britain as blind Coal, and in the United States as anthracite, no doubt gives off scarcely any volatile matter; but this is because it has undergone a natural distillation through metamorphism or other cause.

Divisions.—We may, therefore, divide Coal into two primary divisions, viz., Anthracite, which does not, and Bituminous, or soft Coal, which does, flame when kindled. Anthracite averages in analysis 85 to 87 per cent. of fixed carbon. The term "anthracite" is applied to all Coals containing more than 80 per cent. of fixed carbon. Various synonyms, such as stone Coal, glance Coal, culm, and Welsh Coal, also are used to designate this substance, which in Great Britain is used chiefly for smelting purposes and for raising steam, but in the United States is used also almost entirely for domestic fuel and manufacturing purposes. It is difficult to kindle, but gives out a high heat in burning, and holds fire for a long time. Bituminous Coal includes an almost endless number of varieties, one of the best marked being cannel or parrot Coal. Cannel Coal is so called from burning with a bright flame like a candle, and the name "parrot Coal" is given to

it in Scotland from the crackling or chattering noise which some kinds of it make when burned. That of different localities varies much in appearance, but it is commonly dull and earthy, or with only a slight luster; some kinds are, however, bright and shining. In texture it is nearly always compact, and certain beds of it admit of being polished in slabs of considerable size, which approach black marble in appearance. Of this material vases, inkstands, boxes, etc., are made. Cannel Coal, from its comparative scarcity and high price, is not suitable for house fires, and is for the most part consumed in making gas, of which it yields from 8,000 to 15,000 cubic feet per ton. When distilled at a low red-heat it yields paraffine oil. The other varieties of bituminous Coal are so numerous that there are as many as 70 kinds of it imported into London alone. Still, among these there are three leading kinds: (1) Caking Coal, which cakes or fuses into one mass in the fire. It breaks into small uneven fragments, and is found largely at Newcastle and some other localities. (2) Splint, or hard Coal, occurring plentifully in Scotland, which is hard and has a kind of slaty fracture. It is not very easily kindled, but when lighted makes a clear, lasting fire. (3) Cherry, or soft Coal, which breaks easily into small, irregular cubes, has a beautiful, shining luster, is readily kindled, and gives out a cheerful flame and heat. It is common in Staffordshire. Brown Coal, or lignite, though inferior to true Coal, is, nevertheless, an important fuel in some countries, in default of a better kind.

Origin.—Several theories as to the origin of coal have been put forth from time to time. The one now generally received is that the rank and luxuriant vegetation which prevailed during the Carboniferous Period grew and decayed upon land raised but slightly above the sea; that by slow subsidence this thick layer of vegetable matter sank below the water and became gradually covered with sand, mud, and other mineral sediment; that then, by some slight upheaval of the sea-bottom or other process, a land surface was once more formed and covered with a dense mass of plants, which in course of time decayed, sank, and became overlaid with silt and sand as before. At length thick masses of stratified matter would accumulate, producing great pressure, and this, acting with chemical changes, would gradually mineralize the vegetable layers into Coal. Some experiments made by Dr. Lindley a few years ago showed that of a large number of plants kept immersed in water for two years, the ferns, lycopodiums, and pines were those which had the greatest powers of resisting decay, and Coal appears to be mainly composed of the substance of the ancient gigantic representatives of these three orders of plants. The interesting fact has also been lately proved by Huxley, Morris, Carruthers, and others, that in many instances the bituminous matter in Coal is formed almost wholly of the spore cases and spores of plants allied to our club-mosses and ferns.

Sources of Supply.—Since the prosperity of great national industries, as well as much of our domestic comfort, depends on the continuance of an abundant and cheap supply of fuel, much anxiety has arisen of late years regarding the future supply and price of Coal. An exhaustive survey of the Coal fields of the world has produced the estimate that there exist in the United States and Alaska, 4,231,000,000,000 tons, of which 22,000,000,000 tons is anthracite, 2,155,000,000,000 tons is bituminous, and 2,054,000,000,000 tons is sub-bituminous and lignite; Canada, 1,361,000,000,000 tons, of which 2,000,000,000 is anthracite and 313,000,000,000 is bituminous; China, 1,097,000,000,000 tons, of which 427,000,000,000 is anthracite; Germany, 467,000,000,000 tons, of which 452,000,000,000 tons is bituminous and the rest sub-bituminous; Great Britain, 209,000,000,000 tons, of which 12,000,000,000 is anthracite; Siberia, 192,000,000,000 tons, no anthracite; Australia, 183,000,000,000 tons, all bituminous or sub-bituminous; India, 87,000,000,000 tons, no anthracite; Russia in Europe, 66,000,000,000 tons, of which 41,000,000 is anthracite; Union of South Africa, 62,000,000,000 tons, of which 13,000,000,000 is anthracite; Austria, 59,000,000,000 tons, no anthracite; Colombia, 30,000,000,000 tons, no anthracite; Indo-China, 22,000,000,000 tons, all anthracite; France, 19,000,000,000 tons, of which 4,000,000,000 is anthracite; Belgium, 12,000,000,000 tons, no anthracite; Spain, 10,000,000,000 tons, of which 2,000,000,000 is anthracite; Spitzbergen, 9,000,000,000 tons, no anthracite; Japan, 9,000,000,000 tons, no anthracite; Holland, 5,000,000,000 tons, no anthracite; other countries, 24,000,000,000 tons, of which 3,000,000,000 is anthracite.

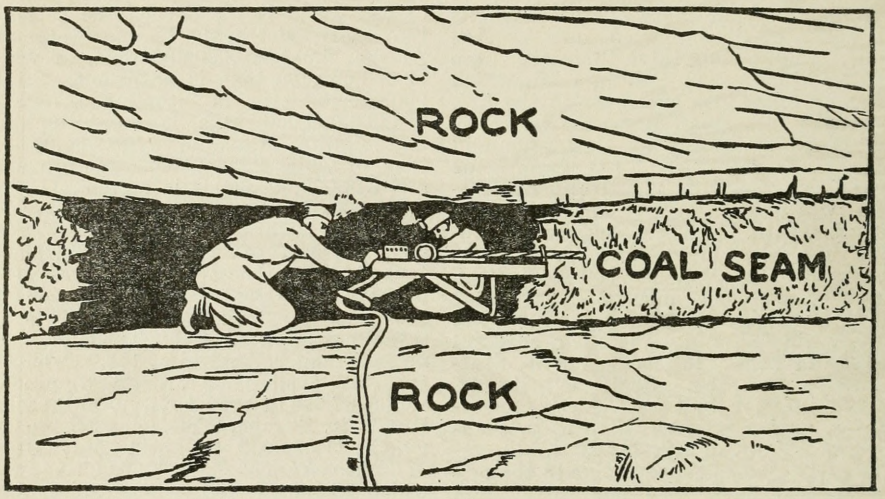
Total Coal reserves, 8,154,000,000,000 tons, of which 548,000,000,000 is anthracite; 4,302,000,000,000 is bituminous, and 3,304,000,000,000 is sub-bituminous and lignite.

Coal in the United States.—The entire area of these is about 330,000 square miles. The principal fields are (1) Eastern, approximately 70,000 square miles; (2) the Interior area, about 133,000 square miles; (3) the Gulf area,

about 2,100 square miles; (4) the Northern or Great Plains area, about 88,000 square miles; (5) the Rocky Mountain area, about 37,000 square miles; (6) and (7) Pacific Coast area, about 1,900 square miles.

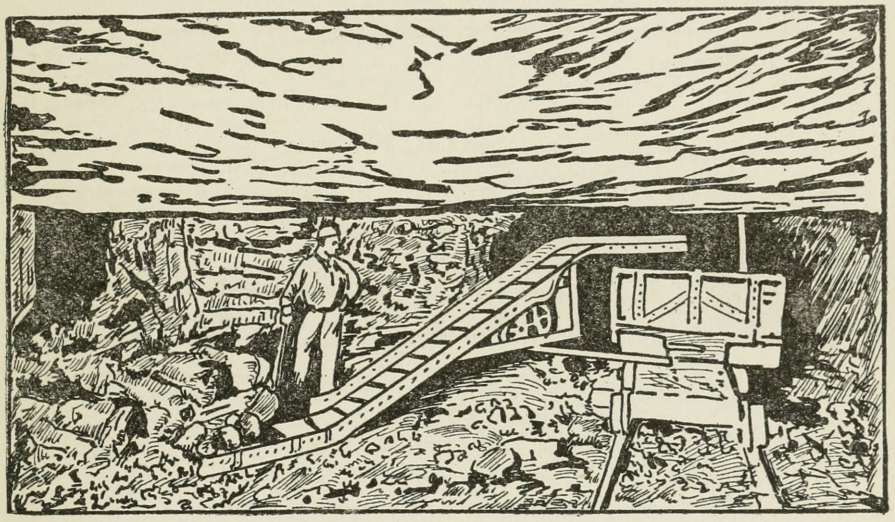
Anthracite Areas. — Commercially speaking, the anthracite division may be said to consist of Pennsylvania alone, although a small amount of anthracite coal is mined in other States. The original Coal beds of New England have been metamorphosed into graphite and graphitic Coal. This area is confined to eastern Rhode Island, and the counties of Bristol and Plymouth, Mass. The product mined from the beds, which may be more properly called graphite than Coal, requires a considerable degree of heat for combustion, and can be used only with other combustible material or under an intense draught or blast. Its principal use is in the direct manufacture of steel; the entire annual output is but a few thousand tons. There are five recognized principal divisions of the Pennsylvania anthracite region: (1) The Southern or Pottsville field, extending from the Lehigh river, at Mauch Chunk, S. E. to within a few miles of the Susquehanna river, directly W. of Harrisburg. (2) The Western Middle or Mahanoy and Shamokin field, extending from the easternmost headwaters of the Little Schuylkill river to the Susquehanna. These are sometimes grouped together and given the common name of the Schuylkill region. (3) The Eastern Middle or upper Lehigh field, lying between the Lehigh river and Catawissa creek, and mostly situated in Luzerne co. (4) The Northern or Wyoming and Lackawanna, mostly in Luzerne and Lackawanna cos. (5) The Loyalsock and Mehoopany field is within the area drained by the headwaters of two creeks of that name, 20 or 25 miles N. W. of the W. end of the field last mentioned. The anthracite region of Pennsylvania, as a whole, has a maximum length of about 115 miles, a maximum breadth of about 40 miles; area about 1,700 square miles; but the area underlaid by workable Coal beds is only about 470 square miles.

Bituminous Areas.—The bituminous Coal areas of the United States may for convenience be grouped into seven divisions: the Triassic, the Appalachian, the Northern, the Central, the Western, the Rocky Mountain, and the Pacific Coast areas. The eastern Triassic area is composed chiefly of the Richmond basin, in Virginia, and the Deep River and the Dan River fields, in North Carolina. No extensive mining operations are now carried on in this area. The Appalachian field is immediately W. of the E. border of the Appalachian range, and extends from New York on the N. to Alabama on the S., its direction being N. E. and S. W.; length, about 900 miles; width, from 30 to 180 miles. There are in this region many varieties of bituminous Coal, the best and most productive beds on the whole being those of the Pittsburgh district and of West Virginia. The thickness of the coal measures in different sections varies from 100 to over 3,000 feet. The northern bituminous area is all in central Michigan. The coal here found is not of superior quality, and is used mostly



MINING COAL WITH AN ELECTRIC DRILL

for local supply. Of the central area three-fourths are in Illinois, less than one-sixth in Indiana, and about one-twelfth in western Kentucky. In the western field the most extensive mining operations have been carried on in Iowa and Missouri; its area is greater than that of any other one Coal field in the United States. The coals are of great variety; the best which has so far been mined is that of the Indian Territory. The Rocky Mountain Coal beds have have been found in the geological formations from the Carboniferous up to and including the Cretaceous, differing in this respect from those hitherto enumerated, which, with the exception of that in Virginia and North Carolina, are all confined to the Carboniferous. Coal has been mined in the Pacific States.



JEFFREY LOADING CONVEYOR USED IN A COAL MINE

Coal Mining.—The cutting of a path through the harder rocks, as carried on by the ancient miners, was particularly laborious and unhealthy. Miners became subject to disorders of the lungs at an early age. Previous to the introduction of blasting, the implements used were wedges and hammers. Bit by bit pieces of rock were broken away, the operation being assisted by natural fissures in the rock and by the brittleness of the hard material. In this way the ancient miners cut coffin-shaped galleries 5 feet in height. At the present time the galleries or levels are usually 7½ feet high and 5 feet wide, thus affording facilities for traveling and for ventilation. Gunpowder was not applied to mining purposes until the beginning of the 17th century, and it made its way so slowly that it was not largely employed until the 18th century. Of late years rock-drills driven by steam or by compressed air have come largely into use. The bore-hole, when finished, is then charged. The gunpowder is inclosed in a little bag of cloth dipped in pitch and provided with a fuse. The fullest benefit of modern explosives, such as dynamite, gun-cotton and yonite, can be obtained only by the use of strong detonators fired by electricity, by which it is impossible to place a number of bore-holes in such a manner that when fired simultaneously they shall help one another. Blasting powder is still used for removing coal and millions of tons are obtained by its aid. In order to obviate the danger of explosions in fiery collieries, many ingenious substitutes for blasting have been proposed. For example, a hole is bored and wedges inserted to force down the Coal which has previously been under-cut with the pick.

Various machines have been invented with a view of lessening the labor and expense of under-cutting coal seams. They work with compressed air or electricity, and have the cutters arranged on the periphery of a rotating disc, or on a traveling pitch chain. The coal, when broken down, is placed in cars and drawn to the bottom of the shaft and raised to the surface. The actual mode of working the coal varies greatly in every district. By the post-and-stall, or board-and-pillar, or (in Scotland) stoop-and-room, method the first stage of excavation is accomplished with the roof sustained by coal; in the long-wall method the whole of the coal is allowed

to settle behind the miners, no sustaining pillars of coal being left. This, when well planned, is the safer, both as regards facility of ventilation and less liability to accidents from falls. At a Durham colliery, working the Harvey seam, 3½ feet in thickness, 5,185 tons of coal were obtained when working by the long-wall system and 5,052 tons when working by the post-and-stall system. In thick and highly inclined beds it is usual to remove the coal by horizontal slices and to fill the excavation with waste material. In some instances blast furnace slag is used for the purpose.

The great depth and size of modern collieries necessitate the raising of vast quantities of coal through a single shaft and the winding engines of modern erection are of extraordinary power.

Production.—The total coal production of the United States in 1919 was 544,263,000 short tons. Of this 458,063,000 tons were bituminous and 86,200,000 tons were anthracite. This production was a decrease of 133,949,000 tons over that of 1918. Pennsylvania produced the largest amount of coal for 1919, 145,300,000 tons of bituminous coal and 86,200,000 of anthracite coal. West Virginia was second with 75,500,000 tons; Illinois third with 64,600,000 tons; and Ohio fourth with 35,050,000 tons. Other States producing over 10,000,000 tons were Alabama, Indiana, and Colorado. The number of employees in the coal mines in the country in 1918 was 762,426. Of these 147,121 were employed in the anthracite mines and 615,305 were employed in the bituminous mines. The total value of the coal produced in 1918 was $1,828,290,287.

During the participation of the United States in the World War, the production of coal in sufficient quantity became an important problem. In 1918-1919 strikes in various fields produced a shortage of coal, and only by the most rigorous methods of distribution was it possible to obtain sufficient quantities to keep industrial plants running and to supply domestic demands. During 1918 industrial plants were shut down for certain periods owing to a shortage of coal. In 1920 conditions had greatly improved, and there was no alarming shortage of coal during that year. On Aug. 30, 1920, President Wilson approved a report of an anthracite wage commission which awarded from 17 to 20 per cent. increase over their previous pay to men employed in the anthracite coal mines. The men refused to accept the provisions of the commission and undertook a strike in September. The President refused to reopen the question of the wage award, and the strike subsided. The coal output for the first 8 months of 1920 indicated an increase in production over 1919. For 205 working days the production of bituminous coal was 347,406,000 tons, and nearly 30,000,000 tons more than were produced in the same period of 1919.

History.—The use of coal does not seem to have been known to the ancients, nor is it known at what time it began to be used for fuel. Some say that it was used by the ancient Britons, and at all events it was to some extent an article of household consumption during the Anglo-Saxon period as early as A. D. 852. There is reason for thinking that England was the first European country in which coal was used to a considerable extent. About the end of the 13th century it began to be used in London, but at first only in the arts and manufactures, and the innovation was complained of as injurious to health. In 1316 Parliament petitioned the king, Edward II., to prohibit the use of coal, and a proclamation was accordingly issued against it; but owing to a high price of wood its use soon became general in London. It was for a long time known there as Sea-Coal, because imported by sea.

COALDALE, a borough of Pennsylvania, in Schuylkill co. It is on the Lehigh and New England, and the Central of New Jersey railroads, and is the center of an important coal mining region. Pop. (1910) 5,154; (1920) 6,336.

COAL GAS, a mixture of gases produced by the destructive distillation of coal at regulated temperatures. It is used in lighting streets, houses, etc., and for cooking and heating purposes. Coal gas is colorless and has a disagreeable smell. It is purified from H_2S by ferric hydrate, which is moistened with $FeSO_4$ and H_2SO_4 to remove ammonia. The carbon disulphide can be removed by passing it through an iron tube filled with iron turnings and heated to redness. Coal gas consists of a mixture of hydrogen, 40 to 50 per cent., carbon-monoxide about 5 per cent., marsh gas (CH_4) about 40 per cent., which contribute nothing to the illuminating power of the gas; it depends upon the presence of heavy hydro-carbons, principally C_2H_4 ethene, ordinary gas containing about 4 per cent., and cannel gas about 8 per cent. Coal gas also contains small quantities of acetylene, butylene, etc., and aromatic hydro-carbons, as benzine, etc. The percentage of nitrogen is very variable. When gas is burned a large quantity of water is formed, hence, if a gas stove is used to dry a room there must be sufficient ventilation to carry off the

aqueous vapor. The escape of coal gas from pipes into the soil is very injurious to the roots of trees and shrubs. The admixture of a very small quantity of air greatly impairs the illuminating power of coal gas. Three causes are capable of decreasing the luminosity of flame, viz.: (1) withdrawal of heat; (2) dilution; and (3) oxidation of luminous material. See GAS.

Poisoning by coal gas, is known only as an accident. Occasionally sudden fatal consequences ensue among workmen from exposure to a sudden rush of undiluted gas from gasometers and mains. More commonly, slowly fatal cases result from the gas-tap in a bedroom being left open carelessly, from accidental extinction of the light, from blowing the gas out, or from leakage of the pipes in a house, or at a distance, the gas gaining entrance to the house in the latter case through cellars, walls, and more especially by means of drains and sewer-pipes.

COAL OIL, a name sometimes given to PETROLEUM (*q. v.*).

COAL TAR, tar produced in the destructive distillation of bituminous coal. It is a thick, sticky, dark-colored substance, and is used in the manufacture of printers' ink, for asphalt pavements, coating ships, etc. The composition of coal tar varies according to the temperature at which the coal is distilled, the higher the temperature the larger being the yield of solid bodies. Coal tar when distilled first gives off gas, then water containing ammoniacal salts, then a brown light oil which, when purified, is called coal-naphtha; at higher temperatures a yellow, heavy, fœtid oil called dead-oil, or creosote oil, then naphthalene; afterward the black residue in the retort solidifies on cooling and forms pitch, which is used to form asphalt, and a black varnish to protect iron from rust. If the distillation is continued, the pitch yields a yellow substance like butter, containing anthracene, phenanthrene, fluorene; afterward, at red heat, a bright orange powder, consisting chiefly of pyrene $C_{16}H_{10}$ and chrysene $C_{18}H_{12}$; the residue forms a hard, porous coke. Coal tar colors are dyes prepared from aniline, naphthalene, phenol, and other compounds contained in coal tar. See DYEING.

COAL TAR COLORS. See DYEING.

COAN, TITUS (kō'an), an American missionary; born in Killingworth, Conn., Feb. 1, 1801. After spending several months (1833-1834) on a dangerous exploring expedition in Patagonia, he went to the Sandwich Islands (1835), occupying the Hilo station 47 years, and in that time converting 14,000 natives. He wrote: "Adventures in Patagonia" (1880); "Life in Hawaii" (1881). He died at Hilo, Hawaii, Dec. 1, 1882.

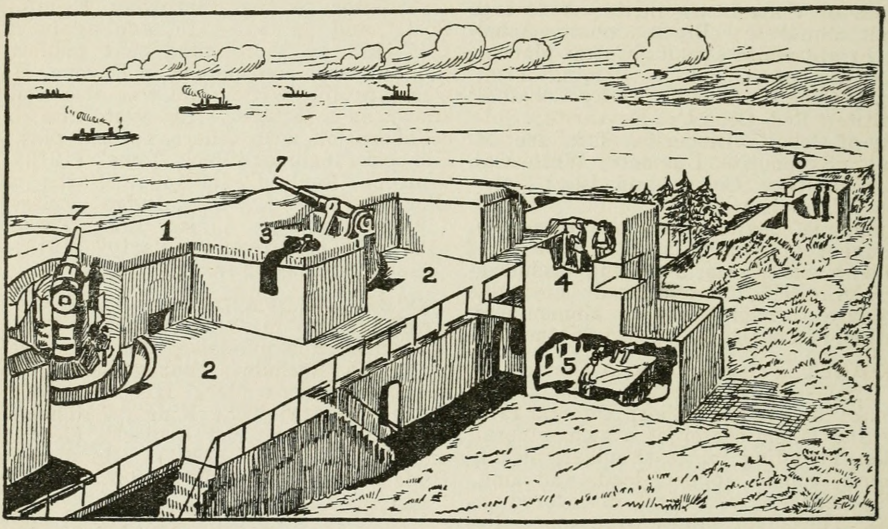
COANZA, or **KUANZA**, a river of Portuguese West Africa, flows generally N. W., and enters the Atlantic about 30 miles S. of St. Paul de Loando, by a mouth over a mile broad. It is navigable for light vessels as far as the Cambambe cataracts, over 120 miles.

COAST AND GEODETIC SURVEY, UNITED STATES, a bureau of the Department of Commerce, charged with the survey of the Atlantic, Gulf, and Pacific coasts of the United States, including the coast of Alaska; the survey of rivers to the head of tidewater or ship navigation; deep-sea soundings, temperature and current observations along the said coasts and throughout the Gulf Stream and Japan Stream flowing off from them; magnetic observations and gravity research; determination of heights by geodetic leveling, and of geographical positions by lines of transcontinental triangulation, which with other connecting triangulations and observations for latitude, longitude, and azimuth, furnish points of reference for State surveys and connect the work on the Atlantic coast with that on the Pacific. Results of the survey are published in the form of annual reports, which include professional papers of value; bulletins which give information deemed important for immediate publication; notices to mariners, issued monthly; tide tables, issued annually; charts upon various scales, including harbor charts, general charts of the coast, and sailing charts; chart catalogues and "Coast Pilots."

COAST ARTILLERY. See ARTILLERY.

COAST DEFENSE, a system of fortifications to protect a country from hostile attacks or occupations on its coast lines. It consists of forts well equipped with heavy guns and thoroughly manned and placed at strategic points. It includes also torpedo boats, submarines, harbor mines, searchlights, and all the other adjuncts that make the work of the forts effective. The extensive coast line of the United States has required a great expenditure of money, planning, and ingenuity in order to secure the country's safety in time of war. Adequate attention had not been given to this important work before the outbreak of the World War; but the lessons taught by that great conflict have stimulated the energy of the navy department and the liberality of Congress. All ports of commercial or strategic value along both coasts of the United States have now been

fortified. As fast as possible, the old 12-inch guns have been superseded by 14-inch guns that are designed to fire projectiles weighing 1,660 pounds to a distance of 18,000 yards. At Cape Henry it is proposed to mount 16-inch wire-wound guns, throwing a projectile of 2,200 pounds. The present policy of the navy department is to mount one 16-inch gun in the system of fortifications guarding every important harbor. The regular establishment of the coast defense is divided into three districts, the North Atlantic Coast, the South Atlantic Coast, and the Pacific Coast. The former has 77 companies; the second, 43; and the third, 36. Besides these there are in Manila bay 11 companies, in Hawaii 6, and in Panama 8. The regular establishment of the coast artillery is 1,201 officers and 29,973 men. As regards their duties, the troops of the coast defense are thus classified: Coast artillery regulars who man the guns, coast artillery militia who serve as substitutes or auxiliaries to the regular gun crews, coast artillery supports to protect against land raids, and the coast guard, which includes bodies of infantry, cavalry, and field artillery to oppose any landing by the enemy.



COAST DEFENSE

1. Rampart.
2. Loading Platform.
3. Auxiliary Station.
4. Battery Chief's Station.
5. Calculating Room.
6. Observation Stand.
7. Disappearing Guns.

COAST GUARD, a British force formerly under the customs department, and intended only to prevent smuggling, but now organized also for purposes of defense and governed by the admiralty. The men, who are generally old men-of-war's men of good character, have high pay, and are furnished with free cottages. The force numbers with officers and men about 4,000. In the United States the force is part of the Treasury Department. See COAST SURVEY, UNITED STATES.

COATESVILLE, a borough of Pennsylvania, in Chester co., on the Pennsylvania and the Philadelphia and Reading railroads. It is an important industrial center and has manufactures of iron and steel, boilers, brass works, silk, tobacco, automobiles, etc. Its notable buildings include the Y. M. C. A. building and a hospital. Pop. (1910) 11,084; (1920) 14,515.

COATI, or **COATI-MONDI**, a name of South American plantigrade carnivorous mammals, of the genus *Nasua*, belonging to the *ursidæ* or bears, but recalling rather the raccoon or civet, and having a long proboscis or snout. They feed on worms, insects, and the smaller quadrupeds, but chiefly on eggs and young birds.

COAT OF ARMS. See HERALDRY.

COBALT, a metallic element, at. wt. 59, symbol Co. The metal was first obtained in an impure state by Brandt, in 1733. It occurs as speiss cobalt, or tin-white cobalt $CoAs_2$, and cobalt-glance, CoAsS. Cobalt occurs in meteoric iron. Metallic cobalt is a hard, magnetic, ductile, reddish-gray metal, with a high

melting point. Its sp. gr. is 8.9. It is not easily oxidized by the air, when pure. It is dissolved by dilute HCl or H_2SO_4 with evolution of hydrogen. Cobalt forms two oxides: Cobaltous oxide CoO and Cobaltic oxide Co_2O_3. The alloys of cobalt are unimportant. Zaffre is an impure oxide of cobalt prepared by roasting cobalt ores with twice their weight of sand. Smalt is prepared by fusing partially roasted cobalt ores with a mixture of powdered quartz and potassium carbonate; while hot it is poured into water and then ground to a fine powder; it is used as a pigment; this color was known to the ancients. The cobaltous salts are the most stable in which cobalt acts as a dyad element. Cobalt compounds give a blue color to a borax bead.

There is no native cobalt known, but many ores of the metal. Arsenate or Arseniate of Cobalt=Erythrite; Arsenical Cobalt=Smaltite; Black Cobalt=Asbolite; Bright-white Cobalt=Cobalt-glance; Carbonate of Cobalt = Remingtonite; Earthy Cobalt=Asbolite; Gray Cobalt= Smaltite; Red Cobalt = Erythrite; Sulphate of Cobalt=Bieberite; Sulphuret of Cobalt=Syepoorite, Linnæite; White Cobalt=Smaltite; Cobalt and Lead Selenite=Tilkerodite.

Ammonia cobaltous salts are formed by the union of cobaltous salts with ammonia in excess, the air being excluded, as, $CoCl_{2.6}NH_3$, rose-colored crystals. They are formed when an ammoniacal solution of cobalt is exposed to the air.

COBALT, a city of Ontario, Canada, in the Timiskaming district. It is on the Timiskaming and Northern Ontario railway and is the center of a rich mineral region, including mines of silver, nickel, bismuth, cobalt, copper, lead, and zinc. These deposits were first discovered in 1903. The silver mines were especially rich and their discovery resulted in a rush to the locality by a large number of people, and the rapid development of the mines. The town grew rapidly, but in 1912 a large part of it was destroyed by fire. It was, however, rebuilt. Pop. about 6,000.

COBAN, a city of Guatemala, the capital of the department of Alta Vera Paz. It is the center of a fertile agricultural district producing coffee, vanilla, and sugar cane. Pop. about 32,000.

COBB, HOWELL, an American statesman; born in Cherry Hill, Ga., Sept. 7, 1815. He was graduated at Franklin College in 1834, became a lawyer in 1836, and in 1843 was elected to Congress as a Democrat. He served eight years and was Speaker of the House one term. Elected governor of Georgia in 1851, he returned to Congress in 1855, and was made Secretary of the Treasury by President Buchanan in 1857, resigning in 1860 to urge secession. He held a Confederate military commission in the Civil War, but saw little service. He died in New York City, Oct. 9, 1868.

COBB, IRVIN S(HREWSBURY), an American writer, born at Paducah, Ky., in 1876. He was educated in the public schools and privately, and while he was still a boy began contributing humorous matter to periodicals. For a time he served on the editorial staff of several papers in Kentucky. In 1904 he became special writer and editor of the humorous section of the New York "Evening Sun." For several years following he served as a correspondent of other New York papers. In 1911 he became staff contributor to the "Saturday Evening Post," and in 1914-1915, and again in 1917-1918 he represented that publication as war correspondent in Europe. He was a prolific writer and was also well-known as a lecturer. He wrote also, in collaboration with others, several plays. His books include: "Back Home" (1912); "Europe Revised" (1914); "Paths of Glory" (1915); "Old Judge Priest" (1915); "Those Times and These" (1917); "The Life of the Party" (1919); "The Abandoned Farmers" (1920).

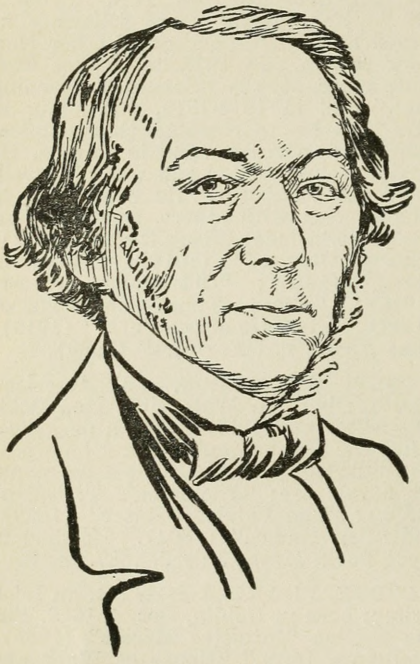
COBB, SYLVANUS, an American novelist; born in Waterville, Me., 1823; was editor and publisher of a periodical called the "Rechabite," but best known as a prolific story-writer. His most popular novels are: "The King's Talisman" (1851); "The Patriot Cruiser" (1859); and "Ben Hamed" (1864). He died in Hyde Park, Mass., July 2, 1887.

COBBE, FRANCES POWER, an Irish writer; born in Dublin, Dec. 4, 1822. She has written "Intuitive Morals" (1855); "Religious Duty," "Hours of Work and Play" (1867); "Duties of Women"; "The Hopes of the Human Race, Hereafter and Here"; "Scientific Speculations of the Age" (1888). Wrote extensively on theological and humanitarian questions and books of travels in Greece, Italy, and Palestine. Died April 5, 1904.

COBBETT, WILLIAM, an English essayist and political writer; born in Farnham, March 9, 1762. The son of a farm hand, he had no early advantages, but a great gift for controversy; and he plunged warmly into the social, economic, and political discussions of his day. He visited this country, and wrote here for a time under the name of "Peter Porcupine." He is at his best in his countless pamphlets, and in "The Political Pro-

teus," "Legacy to Laborers," and "Advice to Young Men." He died near Farnham in June, 1835.

COBDEN, RICHARD, an English politician, the "Apostle of Free Trade," born in Sussex, June 3, 1804. After receiving a meager education he was taken as an apprentice into a warehouse in London where he made up for the defects of his education by diligent self-tuition. In 1830 along with some relatives he started a cotton manufactory in Manchester, which in a few years was very successful. His first political writing was a pamphlet on England, Ireland, and America, which was followed by another on Russia. In



RICHARD COBDEN

these he advocated non-intervention in the disputes of other nations, and maintaining it to be the foreign policy of England to increase and strengthen her connections with foreign countries in the way of trade and peaceful intercourse. Having joined the Anti-Corn-Law League, formed in 1838, it was chiefly his efforts, together with Bright and other zealous fellow-workers, which won victory for the movement.

In 1841 Cobden entered Parliament as member for Stockport, and after several years' effort induced Sir Robert Peel, then prime minister, to bring in a bill for the repeal of the corn laws in 1846. Next year he was chosen member for the West Riding of York, a constituency which he represented for 10 years. His business had suffered while he devoted himself to the agitation, and as a compensation a national subscription was made, and a sum of about $350,000 presented to him. In 1859 he was chosen member for Rochdale and declined, for the second time, a place in the government. He refused also a baronetcy and several other dignities. His last great work was the commercial treaty which he was the means of bringing about between Great Britain and France in 1860. He died in London, April 2, 1865.

COBHAM, LORD. See OLDCASTLE.

COBIJAI (kō-bē'), or **PUERTO LA MAR**, a seaport formerly belonging to Bolivia, now in the territory of Antofagasta, Chile.

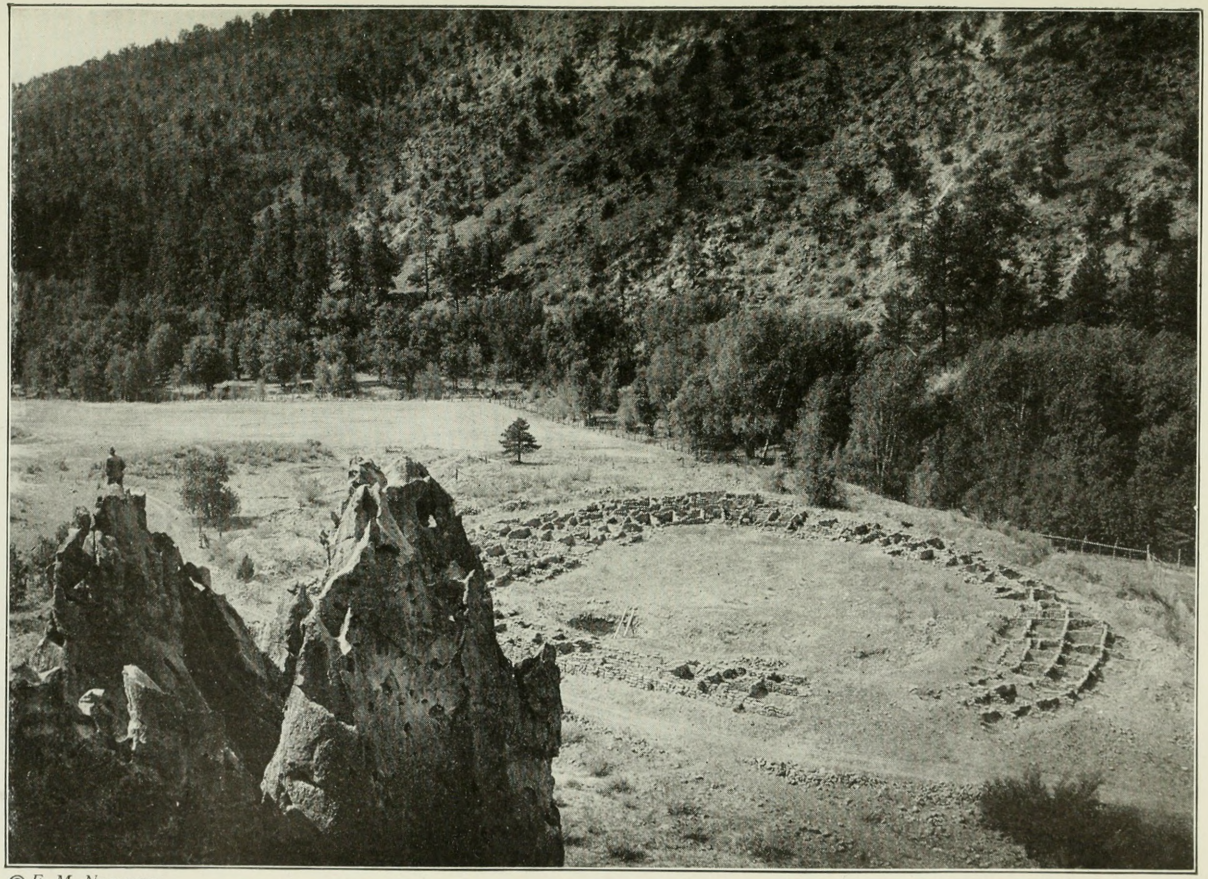
COBLE, or COBBLE, a low flat-floored boat with a square stern, used in salmon-fishery.

COBLENZ (anciently *Confluentes*, from its situation at the confluence of the Rhine and Moselle), a fortified town of Germany, capital of Rhenish Prussia, finely situated on the left bank of the Rhine in the angle between it and the Moselle, and connected by a pontoon-bridge over the Rhine with the fortress of Ehrenbreitstein; this, along with its other fortifications is capable of accommodating 100,000 men. The palace of the Elector of Treves was a Prussian royal residence. Its industries before the World War embraced cigars, machinery, champagne-wines, pianos, and it had an important trade in Rhine and Moselle wines. Coblenz was the headquarters of the American Army of Occupation, following the Armistice of November, 1918. Pop. about 60,000.

COB NUT, a large variety of hazelnut.

COBOURG, a town, port of entry, and county-seat of Northumberland co., Ontario, Canada; on Lake Ontario, and the Grand Trunk railroad; 69 miles N. E. of Toronto. It is the seat of a Wesleyan university, and has several woolen mills, car factory, foundries, newspapers, banks, and schools. Pop. about 6,000.

COBRA, or COBRA DE CAPELLO, a species of snake, the *Coluber Naja* of Linnæus, now called *Naja* or *Naia tripudians*. It belongs to the family *Viperidæ*. The head has nine plates behind and is broad, the neck is very expansile, covering the head like a hood, the tail round. The color is brown above and bluish-white beneath. When the disk is dilated the hinder part of it exhibits dark markings like a pair of spectacles



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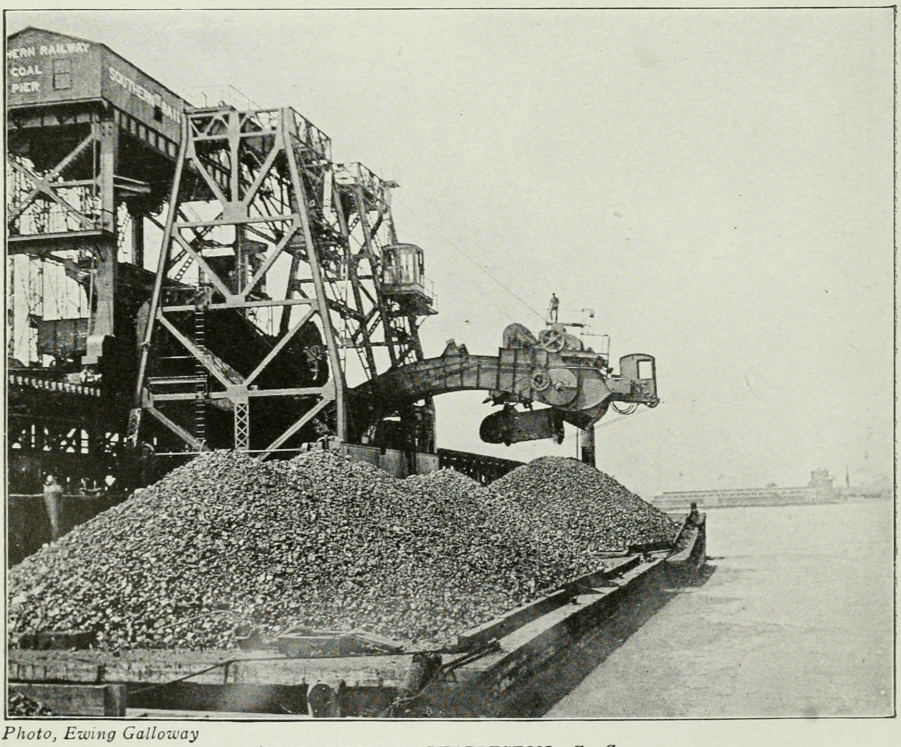
RUINS OF TYUENI, A GREAT COMMUNAL HOUSE OF MORE THAN TWO HUNDRED ROOMS

Enc. Vol. 3 — p. 36



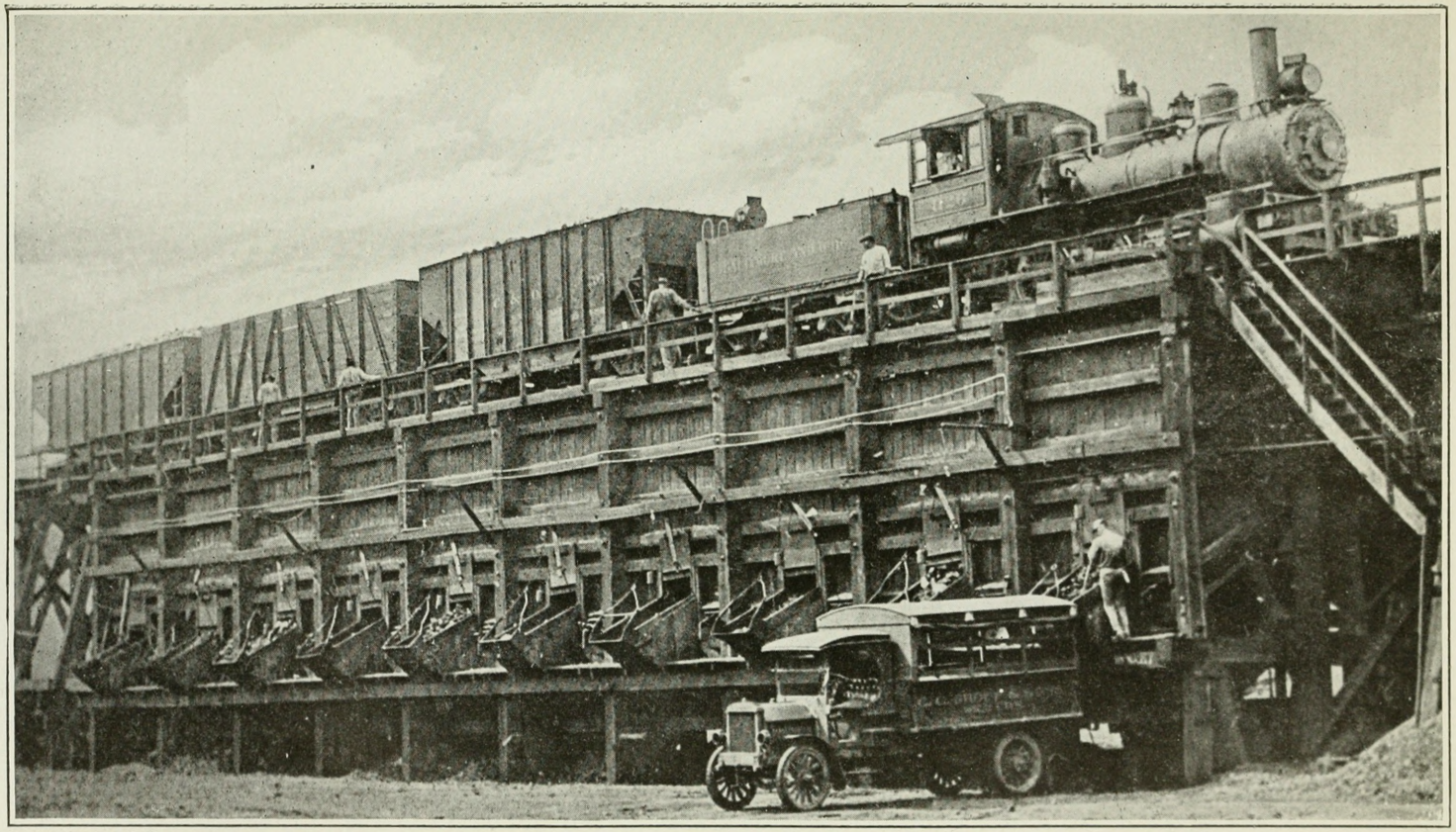
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MINING COAL IN ALABAMA



Photo, Ewing Galloway

COAL PIER AT CHARLESTON, S. C.



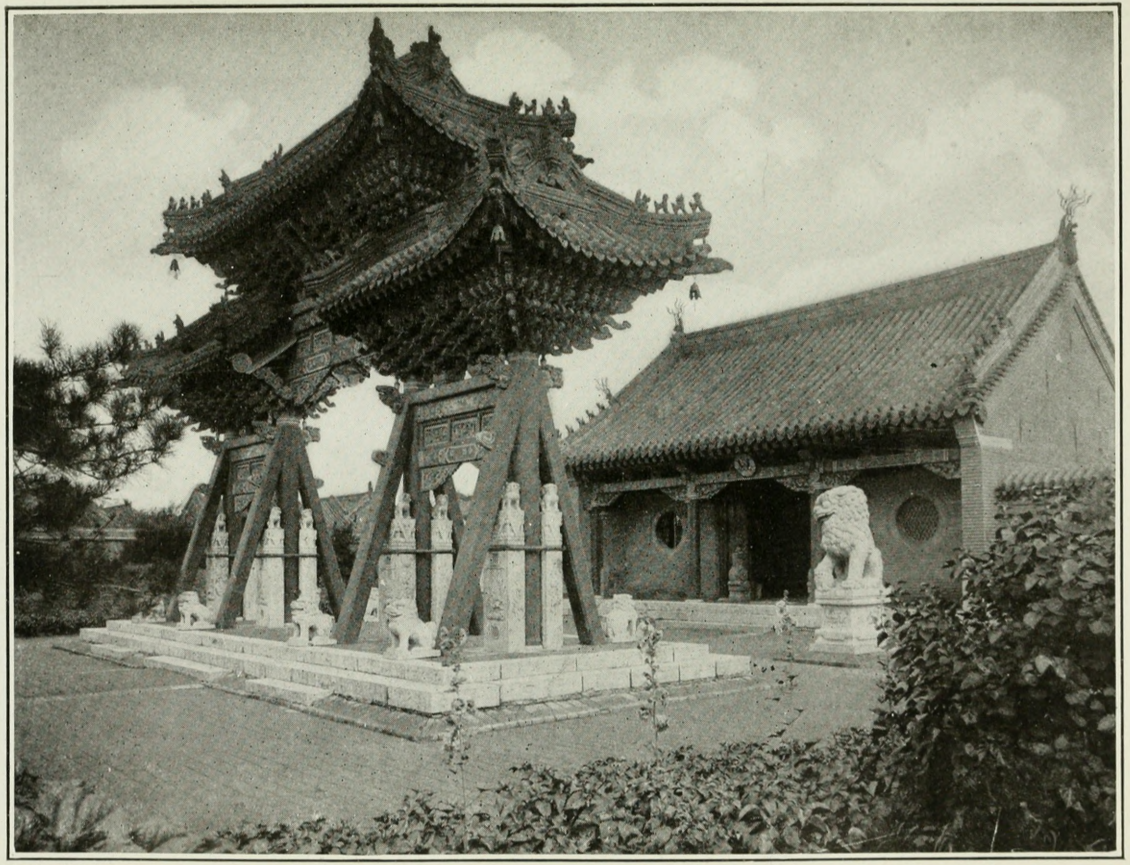
Photo, Ewing Galloway

COAL BINS WITH COAL TRAIN AND CHUTES, CINCINNATI, OHIO



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HEADQUARTERS OF AMERICAN ARMY OF OCCUPATION AT COBLENZ

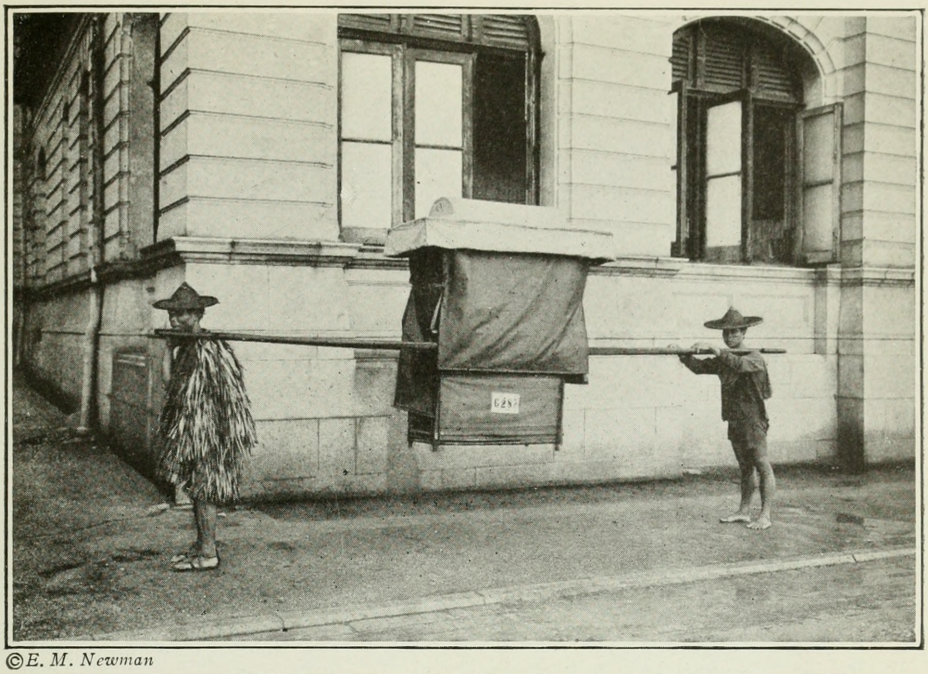


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MUKDEN, CHINA. THE AMERICAN CONSULATE IN A BUILDING THAT WAS FORMERLY A CHINESE TEMPLE



COCOANUTS



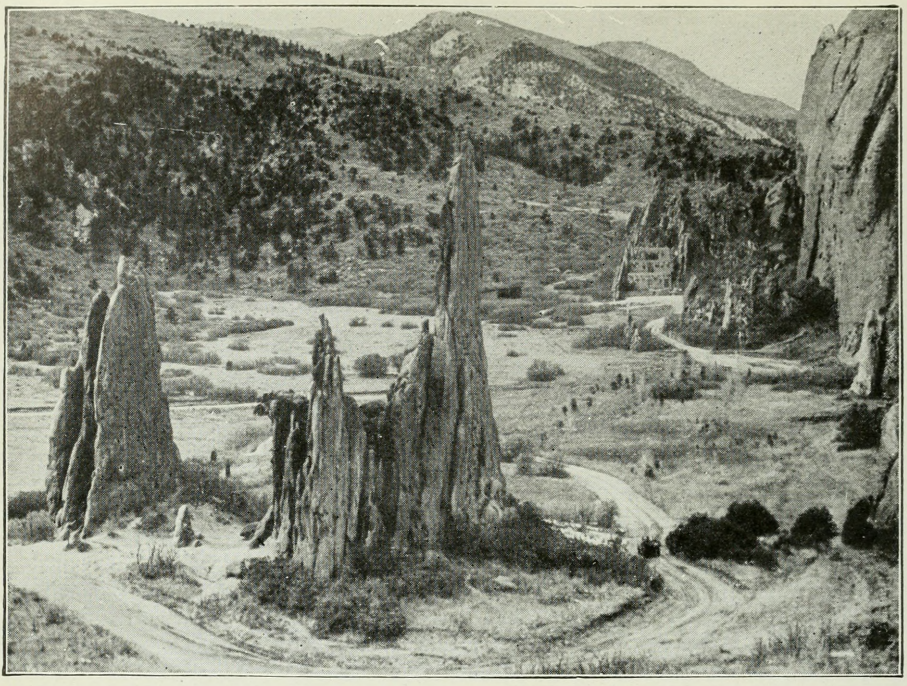
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SEDAN CHAIR AND CHINESE COOLIES, ONE OF WHOM WEARS A RAINCOAT OF DRIED GRASS



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JINRIKISHA DRAWN BY A CHINESE COOLIE



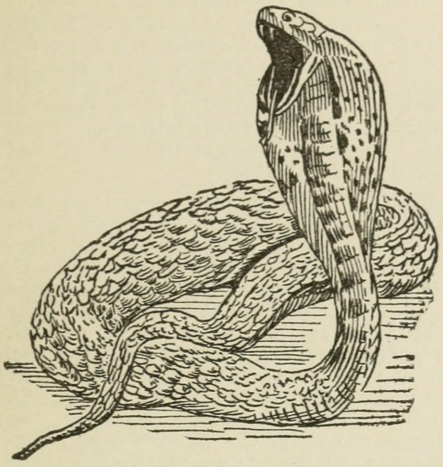
GARDEN OF THE GODS, COLORADO. CATHEDRAL SPIRES AND MOTOR ROADS



Photo, Ewing Galloway

THE DOUBLE HAIRPIN MADE BY THE ROAD ON LOOKOUT MOUNTAIN NEAR DENVER

reversed, whence it is sometimes called the spectacle snake. The common name is, however, the Portuguese one, *Cobra, C. capella, C. de* or *di capello.* It is from two to four or even six feet long, is common in India, and is so venomous that it



COBRA

causes the death of more people than does the tiger. Notwithstanding this, it is kept in various temples, fed with milk and sugar, and worshiped.

COBURG, a thin fabric of worsted and cotton, or worsted and silk, twilled on one side, for ladies' dresses, intended as a substitute for merino.

COBURG, the name of a family in Germany, dating from the 5th century, noted for intermarriages with royal houses, especially during the 19th century. A sister of Duke Ernest I. became Duchess of Kent and mother of Queen Victoria; the duke's brother Leopold became King of the Belgians, and married in succession daughters of George IV. of England and of Louis Philippe; one of his nephews, Ferdinand, married the Queen of Portugal, and was regent of that kingdom, 1853; another, August, married a daughter of Louis Philippe; one of his sons, Duke Ernest II., declined the crown of Greece, 1863, and another, Prince Albert, was the husband of his cousin, Queen Victoria, of England.

COBURG PENINSULA, a peninsula on the N. coast of Australia in the northern territory of South Australia.

COBURN, FOSTER DWIGHT, an American agriculturalist and public official, born in Jefferson co., Wis., in 1846. He was educated in the common schools. After serving in the Civil War he became a farmer and stock raiser in Franklin co., Kan. In 1882 he was secretary of the Kansas Department of Agriculture and from 1894 to 1914 was editor of the Kansas City "Live-Stock Indicator." He was chief of the department of live stock at the St. Louis Exposition and was for many years a regent of the State Agricultural College. He was one of the foremost authorities in agricultural matters in the United States. In 1906 he was appointed United States Senator from Kansas, but declined the appointment. He served as chairman of the Draft Appeal Board of the 1st district of Kansas, in 1917. His works include: "Swine Husbandry"; "The Book of Alfalfa"; "Swine in America," and over 30 volumes on agriculture published by the State of Kansas.

COBWEB, the web or network spun by spiders to catch their prey.

COCA, the dried leaf of *Erythroxylon Coca*, a shrub, 4-8 feet high, growing wild in Peru, and cultivated there on the Andes, between 2,000 and 5,000 feet high. It is used chiefly by the Peruvian miners, who chew its leaves mixed with the ashes of *Chenopodium quinoa.* It is said to give them great power of enduring fatigue on a scanty supply of food. The officinal preparation in the United States is fluid extract of coca.

COCAINE, an alkaloid obtained from the leaves of coca. A new and most important discovery to the medical profession was made in 1884, through pure accident, by a German student who had occasion to experiment with hydrochlorate of Cocaine. Getting some by accident in his eye, he was amazed to find that it caused the surface to become insensible to all feeling. The remedy has already been widely employed by ophthalmic surgeons, with brilliant results. Nor has its use been confined to the eye. When applied locally to the interior of the larynx, to the ear (in severe neuralgia), and to other delicate membranes, its effect is the same; pain and irritability are relieved, and the surgeon is enabled to accomplish his purpose without causing any suffering in cases where general anæsthesia is not desirable. Cocaine is one of the drugs most commonly employed by drug addicts, and its sale is carefully safeguarded in most States. See DRUG ADDICTION.

COCCO, COCO ROOT, or **EDDOES**, plants of the genus *Colocasia*, and of the nearly allied genus *Caladium*, of the order *Araceæ*, widely cultivated in tropical and subtropical countries for their edible starchy root-stocks, of which the

food value broadly corresponds to the potato. They are sometimes included under the name *Yam*, but are totally different from the true yam. The names more strictly belong to *Colocasia antiquorum*, a stemless plant with ovate leaves, and flowers inclosed in a cylindrical erect spathe. This is a native of India, but was early introduced to Egypt and the Mediterranean countries, whence it has now passed even to America. *C. esculenta*, *C. macrorhiza*, or tara, and *C. Himalensis* are also of economic importance in different parts of the world.

COCCOLOBA, a genus of plants, order *Polygonaceæ*. *C. uvifera* is the seaside grape, which grows on the shores of the West Indian Islands, Bermuda, and on the American continent. It has large glossy green leaves with red veins. The berries are eatable. It is an evergreen. The wood is used for cabinet work. A red coloring matter in it is employed as a dye. The wood, leaves, and bark are astringent, and a decoction of them evaporated forms *Jamaica Kino*.

COCCOMILIA, a kind of plum growing in Calabria, the bark of which—especially of the root—is highly esteemed by the Neapolitan faculty for its virtues in intermittent fever.

COCCOSTEUS, a genus of fossil placoganoid fishes, pertaining chiefly to the Devonian and Old Red Sandstone system, but met with also in Silurian strata. The head was protected by a great shield covered with tubercles. Besides this bony cuirass there was also a ventral shield, but the rest of the body was naked. The mouth was furnished with small teeth.

COCCULUS, a genus of plants, order *Menispermaceæ*. In general the species are bitter febrifuges. *C. crispus*, a twining species with tubercles or warts on the stem, found in Sumatra and the Molucca Islands, is used by the Malays in intermittent fevers. The root of what was formerly called *C. palmatus*, but is now designated *Jateorhiza palmata*, found in Mozambique and Oibo, is the calumba-root of commerce, from which a bitter is obtained. A decoction of the fresh roots of *C. villosus* is administered by the Hindus in rheumatism and old venereal complaints. An ink is made from its fruit. In Arabia a spirit is distilled from the acrid berries of *C. Cebatha*.

COCCULUS INDICUS, a popular name given to a species of *Menispermaceæ*, which furnishes certain dried berries constituting an article of commerce. They are imported from the East Indies. There is no botanical species with this exact name. The drupe resembles a round berry, the size of a pea or larger, wrinkled externally, and with a brittle husk. The kernel is intensely bitter. It contains about one-fiftieth of its weight of a powerful bitter narcotic poison called picrotoxin. *C. indicus* is a deadly poison, is used to give a bitter taste to beer, and is thrown into rivers to kill the fish. It has been used in form of ointment in certain skin diseases. They are commonly known in the United States as fish-berries.

COCCUS, the typical genus of the family *Coccidæ*. Many species are hurtful to plants in greenhouses and elsewhere. Gardeners call them bugs. *C. adonidum* (the mealy bug) does damage in hothouses, as does *C. testudo*. *C. vitis* (the vine-scale) injures vines, and *C. hesperidum* oranges. Others, however, are of value as dyes. *C. Cacti*, found on the cactuses, is the cochineal insect. *C. Ilicis*, found on *quercus coccifera*, an evergreen oak in the S. of France, furnishes a crimson dye which has long been known to mankind. *C. polonicus* is used by the Turks as a red dye. *C. lacca* yields lac.

COCCYX, the lowermost portion of the vertebral column, consisting of four, or more rarely five or three, divided terminal vertebræ, which become more or less united into one with the advance of age. They have been called united vertebræ.

COCHABAMBA, a central department of Bolivia, with offshoots of the Eastern Cordilleras, and extensive plateaus. The climate is equable and healthy, and though poor in metals, its fertile valleys render it the richest as well as the most picturesque district of the republic. Agriculture and cattle-raising are the chief occupations. Area, 21,430 square miles; pop. about 730,000. The capital, Cochabamba (8,396 feet above the sea), on a tributary of the Guapay, was founded in 1565, as Ciudad de Oropesa.

COCHIN, a seaport of Hindustan, in the Malabar district of the Madras presidency; on a small island; a picturesque place with many quaint old Dutch buildings. Its harbor, though sometimes inaccessible during the S. W. monsoon, is the best on this coast. Cochin was one of the first places in India visited by Europeans. In 1502 Vasco da Gama established a factory, and soon after Albuquerque built a fort; he also died here in 1524. In 1663 the Dutch took the place, in 1795 the British. Pop. about 20,000.

COCHIN, a small native state of India, on the S. W. or Malabar coast, connected with the presidency of Madras, intersected by numerous rapid streams. Chief products: Timber, rice. Area, 1,361 square miles; pop. about 1,000,000, partly belonging to the Jacobite and Nestorian Churches established here in early times. The capital is Ernakolam.

COCHIN CHINA, a country forming part of the peninsula of southeastern Asia, and generally regarded as comprising the whole of ANAM (*q. v.*) and Lower or French Cochin China. The latter belonged to Anam till, in 1863, a portion of it was ceded to France after a war occasioned by the persecution of French missionaries; another portion being declared French territory in 1867. The territory thus acquired covers about 20,000 square miles. Pop. about 3,050,785. It is now organized into four provinces and 21 arrondissements In the low and wet grounds much rice is grown. In the more elevated districts are grown tobacco, sugar-cane, maize, indigo, and betel. Among the other products are tea, gums, cocoanut oil, silk, spices.

Industrial arts are as yet limited among the natives. But they excel in the use of wood, of which their temples, pagodas, and tombs are built, being ornamented with elaborate carving. They live in villages adjacent to the rivers, which form the chief means of communication. The principal export is rice, mainly to China; cotton and silk are also exported. The majority of the inhabitants are Anamese. In their monosyllabic language, their religious tendencies toward Buddhism or the system of Confucius, and in their social customs they much resemble the Chinese. Upper Cochin China is the name sometimes given to the narrow strip of land on the E. coast of Anam between the mountains and the sea extending from Tonquin on the N. to Champa on the S., or from about 18° to 11° N. In the World War of 1914-1918 Anamite troops fought with the French in the Balkan campaigns.

COCHIN, HENRY DENYS BENOÎT MARIE. A French author, born in Paris in 1854. He was educated at the Lycée Louis-le-Grand, graduating in literature and law. During the Franco-German war he was a volunteer in the 17th batallion of the Garde Nationale. In 1877 he became attaché to the Minister of the Interior; and deputy in 1893, remaining in the Chamber till 1914, when he retired in favor of his son. For four years he was Conseiller Général of the North. His works include: "Giulietta et Roméo," "Le Manuscrit de M. Larsonnier," "Boccace," "Un Ami de Pétrarque," "Le Frère de Pétrarque," "La Vita Nuova de Dante traduite et commentée," "Tableaux flamands," "Jubilés d'Italie," "Lamartine et la Flandre," "Les deux Guerres," "L'Œuvre de guerre du peintre Albert Besnard," this last appearing in 1918.

COCHINEAL, a dye-stuff employed in dyeing scarlet and crimson; consists of the bodies of the females of a species of *Coccus*, called *C. cacti*, because it feeds upon plants of the *Cactus* family, particularly on one, therefore designated the cochineal plant. The cochineal insect is a small creature, a pound of Cochineal being calculated to contain 70,000 in a dried state. The male is of a deep red color, and has white wings. The female, which is wingless, is of a deep brownish color. When a plantation of the cochineal plant has been formed the cultivator (*nopalero*) procures branches laden with cochineal insects and after the eggs are laid places the females with the eggs which they cover in nests of a soft substance upon the cochineal plants, and the young insects, when hatched, soon spread over them. The insects are killed by boiling water, by heating them in ovens, or by exposure to the heat of the sun. They must be speedily killed to prevent them from laying their eggs, which diminishes their value.

COCHINEAL FIG, a name given to *Opuntia cochinillifĕra* and two other species of cacti, natives of Mexico and the West Indies, the plants on which the cochineal insect lives.

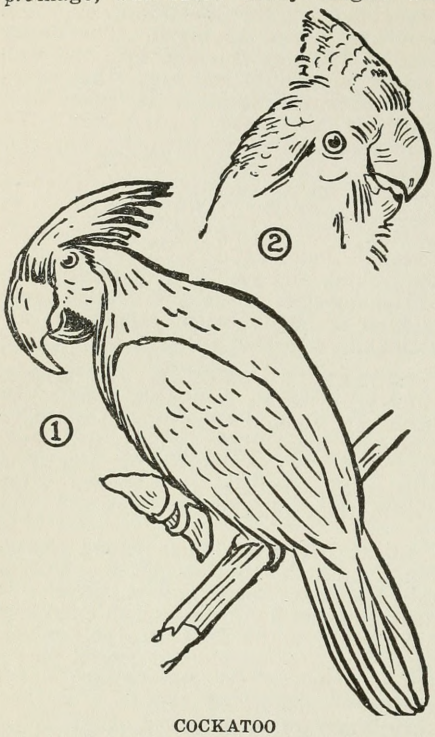
COCHLEA (kok'lē-a), an important part of the internal ear, so called from its shape, which resembles that of a snail-shell.

COCHLEARIA, a genus of cruciferous plants, including the horse-radish and common scurvy-grass.

COCKADE, a plume of cock's feathers with which the Croats in the service of the French in the 17th century adorned their caps. A bow of colored ribbon was adopted for the cockade in France, and during the French revolution the tricolored cockade—red, white, and blue—became the National distinction. National cockades are now to be found over all Europe.

COCKATOO (*Plyctolophus*), a genus of birds of the parrot family, but distinguished from true parrots by the greater heights of the bill, and its being curved from the base, and by the lengthened, broad, and rounded tail. A crest of long and pointed feathers can be erected and

expanded like a fan. The true cockatoos are also all of generally whitish plumage, but often finely tinged with



COCKATOO
1. Roseate Cockatoo.
2. Head of Black Cockatoo.

red, orange, and other colors, or mixed with these colors.

COCKATRICE, a fabulous monster anciently believed to be hatched from a cock's egg. It is often simply another name for the basilisk.

COCKBURN, SIR ALEXANDER, an English jurist; born Dec. 24, 1802; studied at Cambridge; was called to the bar in 1829, and soon became distinguished as a pleader before Parliamentary committees. In 1847 he became member of Parliament for Southampton in the Liberal interest; became Solicitor-General and was knighted in 1850; was made Chief-Justice of the Common Pleas in 1856; and Lord Chief-Justice in 1859. He presided at the Tichborne and other famous trials. He represented Great Britain at the Geneva arbitration in the "Alabama" case. He died Nov. 20, 1880.

COCK CHAFER, the popular name of a lamellicorn beetle, *Melolontha vulgaris*, found in England. The larvæ are found in dung or in decaying vegetable matter or buried in the ground.

COCKER, a dog of the spaniel kind, allied to the Blenheim dog, used for raising woodcocks and snipes from their haunts in woods and marshes.

COCK-FIGHTING, an amusement practiced in various countries, first perhaps among the Greeks and Romans. At Athens there were annual cock-fights, and among the Romans quails and partridges were also used for this purpose. It was formerly a popular sport with the British. In Cuba and the Philippines it enjoys great favor. Cock-fighting is generally prohibited by local laws in the United States.

COCKLE, a plant, *Lychnis Githago*, formerly called *agrostemma githago*. Its fuller English name is corn-cockle. It is an erect-branched plant, between one and two feet high with large purple flowers.

It is also the popular name of the shells classed by naturalists under the genus *Cardium*, or the family *Cardiadæ*. The most common one is *C. edule;* it is the one to which the name cockle is most frequently applied.

COCK OF THE PLAINS (*Centrocercus urophasiānus*), a large North American species of grouse, inhabiting desolate plains in the W. States.

COCK OF THE ROCK (*Rupicŏla aurantia*), a South American bird of a rich orange color with a beautiful crest, belonging to the manakin family.

COCK OF THE WOODS. See CAPERCAILZIE.

COCKPIT, in a ship of war, the name still given to the compartment in the lower part of the ship where the wounded are attended to during action.

COCKRAN, WILLIAM BOURKE, an American lawyer and public official, born in Sligo, Ireland, in 1854. He was educated in France and Ireland and at Georgetown College, from which he graduated in 1900. After his removal to the United States in 1871 he taught school in Westchester co., N. Y. He was admitted to the bar in 1876 and soon became prominent in New York politics. He was delegate to many conventions, where he became well known as an orator. He opposed the nomination of Grover Cleveland in 1884 and 1892. He was a member of the 52d and 53d Congresses. In 1896 he opposed the silver wing of the party and supported McKinley for president. He returned to the Democratic party, however, in 1900, supporting William J. Bryan. He was elected to the 58th Congress in 1904, but later resigned. He was re-elected to the 59th and 60th Congresses, declining

re-election, but resumed law practice in New York. He was a conspicuous figure at the Democratic National Convention in 1920 and made the speech nominating James M. Cox for presidency.

COCKROACH, generally, any insect of the family *Blattidæ*, or at least, of the genus *Blatta;* and specially, the *B. orientales*, so common in houses, particularly in seaport towns. The cockroach is said to have come originally from India, through the Levant. It is nocturnal in its habits. The eggs are deposited in horny cases, in which they are arranged with much regularity, in two rows, with a central partition, and smaller ones isolating each egg from the other.

COCKSCOMB, the comb of a cock, being a sort of ensign or token which the fool was accustomed to wear. Also a name sometimes given to *Celosia cristata.* The flowers are astringent and are prescribed in Asia in cases of diarrhœa, blennorrhœa, excessive menstrual discharges, hæmatesis, and similar disorders.

COCK'S-FOOT GRASS (*Dactylis*), a genus of grasses, closely allied to fescue. The common or rough cock's-foot grass (*D. glomerata*) is a native of both palæarctic and nearctic regions, and is very abundant in Great Britain. In the United States it is called orchard grass, and is extensively cultivated. To this genus belongs also the tussac grass.

COCLES, HORATIUS, a hero of ancient Rome, who alone, in 506 B. C., opposed the whole army of Porsenna at the head of a bridge, while his companions were destroying it behind him. This effected, though wounded, he leaped into the Tiber and swam safely across.

COCOA. See CACAO.

COCOANUT, a woody fruit of an oval shape, from 3 or 4 to 6 or 8 inches in length, covered with a fibrous husk, and lined internally with a white, firm, and fleshy kernel. The tree (*Cocos nucifĕra*) which produces the cocoanut is a palm, from 40 to 60 feet high. The nuts hang from the summit of the tree in clusters of a dozen or more together. The external rind of the nuts has a smooth surface. This incloses an extremely fibrous substance, which immediately surrounds the nut. The latter has a thick and hard shell, with three black scars at one end, through one of which the embryo of the future tree pushes its way. The kernel incloses a considerable quantity of sweet and watery liquid.

This palm is a native of Africa, the East and West Indies, and South America, and is now grown almost everywhere in tropical countries. The kernels are used as food and yield a valuable oil. When dried before the oil is expressed they are known as *copra.* The fibrous coat of the nut is made into the well-known cocoanut matting; the coarse yarn obtained from it is called *coir,* which is also used for cordage. The hard shell of the nut furnishes cups and utensils. The fronds are wrought into baskets, mats, sacks; the trunks are made into boats or furnish timber for houses. By boring the tree a white sweetish liquor called *toddy* exudes from the wound, and yields by distillation one of the varieties of the spirit called *arack.* A kind of sugar called *jaggery* is also obtained from the juice by inspissation.

COCOANUT BEETLE (*Batocera rubus*), a large longicorn beetle, the larvæ of which are very destructive in cocoanut plantations. They are destitute of feet, large and pulpy, and of repulsive aspect; but are esteemed a luxury by the coolies of the East.

COCO DE MER (also called Sea or Maldive Double Cocoanut), the fruit of the *Lodoïcea Seychellarum* palm. Its double kernel has long had an extraordinary value in the East as a poison antidote. The tree on which it grows is peculiar to some of the Seychelles Islands, reaches a height of 100 feet, and has very large fern-like leaves.

COCOON, the silken sheath spun by the larvæ of many insects in passing into the pupa or resting stage. The cocoon proper is due to the secretion of special spinning glands, situated anteriorly or posteriorly, but larval hairs and foreign objects of many kinds may also be utilized. The most typical and perfect cocoons are those of many moths, a familiar example being that of the silkworm.

COD, a fish of the family *Gadidæ*, almost rivaling the herring in its importance to mankind. The roe of the female has been estimated to contain 4,000,000 to 9,000,000 eggs, which, when expelled, float on the surface of the ocean. The cod is found in all northern parts of the Atlantic ocean and in the Arctic seas. See COD-LIVER OIL.

CODA, in music, an adjunct to the close of a composition, for the purpose of enforcing the final character of the movement.

CODDINGTON, WILLIAM, the founder of the colony of Rhode Island; born in England, in 1601, and arrived in Massachusetts in 1630. He remained in

Boston for several years, but disagreements with the authorities caused him to remove in 1638 to Aquidneck, or Rhode Island, where he founded a colony to be governed "by the laws of the Lord Jesus Christ." This scheme was soon abandoned, and in 1640 he himself was chosen governor. He was unable to secure the reception of Rhode Island into the colonial confederacy. In 1674 and 1675 he was again elected governor. He died in 1678.

CODE, a systematic collection or digest of laws, classified and simplified.

(1) *Code Napoléon*—The name given to a code promulgated in France in 1804, originally under the name of Code Civil des Français, but altered to Code Napoléon under Bonaparte.

(2) *Code of Justinian.*—[Named after Justinian, who was born of obscure parentage in A. D. 482 or 483; became emperor at Constantinople, April, 527; added Italy and Africa to his empire, and died Nov. 15, 565.] A code of law drawn up under the auspices of the Emperor Justinian. In April, 529, was issued a compilation of useful laws or constitutions from Hadrian to Justinian. In December, 534, a revised code was published, and was accorded the force of law. It was called "Codex Justinianus repetitæ prælectionis." In December, 533, a commission, headed by the celebrated jurist, Trebonius, published an elaborate work called "Digestæ" (things digested), and "Pandectæ" (embracing all). This also received the force of law. Just before the Digest appeared, there came first, by direction of Justinian, an abstract of the greater work. To this was given the name of "Institutiones." New laws subsequently enacted were published under the name of Novæ or Constitutiones Novellæ, or Authenticæ. They are often quoted as his "Novels." The expression, "Code of Justinian," comprehends the "Code" properly so called, the "Institutes," the "Digest," and the "Novels." The Code of Justinian is a very essential part of the civil law.

(3) *Code of Theodosius.*—[Named after Theodosius II., generally called the younger, who was born on April 10, A. D. 401, and died emperor at Constantinople on July 28, 450.] The Code of Theodosius (Codex Theodosianus) was a collection of laws published in his reign. They acquired legislative force in A. D. 438.

(4) *In the United States.*—The acts of Congress have been codified and are spoken of as the United States Code, and in each State the acts of the different legislatures are usually annually printed and periodically codified.

Social Economy.—Any set of by-laws or of ethical rules or customs governing conduct of the members of a profession or any special branch of the body politic, as the medical code, the naval code, etc.

Cipher Code.—A system of arbitrary words to designate prearranged or predetermined words, figures or sentences. See CIPHER WRITING: CODEX.

CODEIA, CODEINA, or CODEINE ($C_{18}H_{21}NO_3$ or $C_{17}H_{18}(CH_3\ NO_3$, methyl morphine), an alkaloid obtained by digesting opium with warm water, precipitating the meconic acid with calcium chloride, and concentrating the filtrate; the hydrochlorates of morphine and codeine crystallize out first, and may be separated by treating their aqueous solution with ammonia, which precipitates the morphine; the liquid is then evaporated, and the codeine is precipitated by caustic potash and recrystallized from ether.

CODEX, a roll or volume, especially used in compound terms, as *Codex Justinianus*, Code of Justinian, *Codex Theodosianus*, Code of Theodosius. In Biblical criticism, a manuscript of any portion of the New or Old Testament, especially of the former. The original manuscripts of the two Testaments have been lost. In our inability to obtain them for purposes of consultation, it is needful to fall back on other copies as few removes as possible from the original. When in copying the Scriptures the ancient transcribers detected an error committed by some one of their predecessors, they did not simply erase it, but placed it as an erratum on the margin of their copy. As further transcriptions were made fresh errata were similarly noted, till at length the margin became greatly crowded. In attempting to restore the original text great value is attached to the acquisition of any manuscripts made in one of the earliest centuries, from the power it gives one of eliminating errata belonging to subsequent periods. Manuscripts are divided into two classes: *uncials*, written in capitals and with no spaces between the words, and *cursives*, written more in conformity with modern practice. When the New Testament was rendered into English for the authorized version of the Scriptures, the Greek text used, that of Erasmus and Robert Stephens, was based on MSS. more modern than the 10th century. Now, some of much earlier date are available, prominent among which are the five noted below:

Codex A (called also *Codex Alexandrinus*).—The Alexandrian, or Alexandrine, MS. of the New Testament; a MS. sent by the Patriarch of Constantinople as

a present to the English King Charles I., and believed to belong to the middle of the 5th century. A correct edition of it was printed in 1860.

Codex B (called also *Codex Vaticanus*).—The Vatican codex, or MS.; so named because preserved in the Vatican; a very valuable MS., belonging, it is thought, to the middle of the 4th century, if not even older, it was discovered in the latter part of the 14th century.

Codex C.—The Ephraem manuscript, so called because some of the compositions of Ephraem the Syrian had been written over it. It is supposed to be dated at least as early in the 5th century as Codex A.

Codex D.—The manuscript of Beza, called after this eminent reformer, who presented it to the University of Cambridge in 1581. It is supposed to belong to the 6th century.

Codex Aleph or Codex Sinaiticus: The Sinaitic codex, or manuscript; so called because Tischendorf, its discoverer, obtained it from the monastery of St. Katherine on Mount Sinai; the year of the great acquisition was 1859; dating, it is supposed, from the middle of the 4th century. An edition of it was published in 1865.

CODICIL, a supplement to a will, whereby anything omitted is added, or any change demanded by the altered circumstances of the testator or the beneficiaries, is affected. A codicil is authenticated in the same manner as a will, and possesses the same privileges when holograph, or written by the hand of the testator himself.

CODILLA, the coarsest part of hemp and also of flax, sorted out and separated from the rest.

CODLIN MOTH (*Carpocapsa pomonella*), a small moth which infests apple trees. In the Northern States it flies in May, laying its eggs in the calyx after the blossoms fall; in a few days the larva hatches, in three weeks it becomes fully grown.

COD-LIVER OIL, an oil obtained from the liver of the common cod. There are three kinds known in commerce, viz., pale, pale-brown, and dark-brown, the last possessing a very disagreeable taste and smell. Cod-liver oil was first recommended as a remedy for the debility induced by diseases of the lungs about the year 1833.

CODMAN, JOHN, an American sea-captain and miscellaneous writer; born in Dorchester, Mass., 1814. He was author of "Sailors' Life and Sailors' Yarns" (1847); "The Mormon Country" (1876); "Round Trip by Way of Panama, etc." (1879); "Winter Sketches from the Saddle" (1888); etc. He died in Boston, Mass., April 6, 1900.

CODY, WILLIAM FREDERICK, a former United States Government scout; born in Scott co., Ia., Feb. 26, 1845; better known as "Buffalo Bill," a name earned while employed by the Kansas Pacific railway to furnish meat for its laborers, when he slaughtered 4,280 buffaloes in 18 months. He was an unerring shot, a fearless rider and had some thrilling adventures among the savages. In 1872 he was elected to the Nebraska Legislature, and in 1883 organized the "Wild West Show," with which he toured for 20 years. Author, "Life of Hon. W. F. Cody" (1879); "Story of the Wild West" (1888); "Adventures of Buffalo Bill" (1904); "True Tales of the Plains" (1908). Died in 1917.

COE COLLEGE, a coeducational institution in Cedar Rapids, Ia.; organized in 1881, under the auspices of the Presbyterian Church; reported at the end of 1919: Professors and instructors, 61; students, 1,032; president, J. A. Marquis, D. D., LL. D.

COEDUCATION, a method of the liberal education of women and of men in the same college, under similar conditions, and with similar results. It is the method commonly prevailing in American colleges and universities. About three-fourths of all colleges are open to both men and women; the larger share of the remaining one-quarter are open to men only, and the balance, a small number, to women only. The method of coeducation began in Ohio seventy years ago. It has received constant enlargement. Nearly all State universities are now open to both sexes without discrimination. Since coeducation has become the rule, and since separate colleges for women have been established, a method called the co-ordinate has come into view. It represents a university in which a college for women is established, and in which a college for men is also established, each college administered as a separate unit. Yet in its administration, certain executive officers are frequently identical and the members of the two faculties may be granted the right to exchange instruction. The more outstanding examples of this method are Barnard College in Columbia, Radcliffe in Harvard, the Sophie Newcomb College of Tulane University, New Orleans, the Brown University Women's College, and the College for Women of Western Reserve University.

Coeducation possesses certain advantages and disadvantages over separate education. It has the advantage of economy. Many colleges and universities of the Western States were, at their beginning, designed for both women and men, because the people, either as a community or through the churches, believed they ought not to afford two colleges in a single commonwealth. Coeducation, also, is said by its defenders to possess certain rich personal advantages. It is declared, however not without dissent, that it tends to make the male students more courteous. It is also declared that it tends to promote a high type of moral character. For women, too, it is affirmed by its adherents to have special advantages. It develops the forceful type of character, a type which the woman who is to make her way in the world should embody. It is also believed by some that the freer life of the coeducational college tends to do away with fret, and morbidness, and worry, results which are not unknown when women are educated in a group separated from other groups.

Women, themselves graduates of a coeducational college, are very emphatic in their belief in its exceptional worthiness. One says: "I believe that intellectually both sexes are stimulated and helped by association with each other, and that morally the habits of each are improved or kept from deteriorating, as is too frequently the case when either sex gets together in large numbers. There is set up a healthful interchange of thought and magnetic attraction between the sexes, which, when not debased, adds the chief charm to society and lays the foundation for the greatest spiritual development and inspiration of both." Another declares: "It does away with much false modesty that afflicts girls who are kept to themselves, while it does not in the least detract from a girl's true modesty and refinement." Another says: "It leads to a broader sympathy, a truer understanding between men and women; and it tends to banish that consciousness of sex which is inimical to purity of mind." Another graduate declares: "It makes them stronger men and women; they understand each other better; judge of character better; give a higher mutual respect. It takes the simpering out of girls—the roughness out of men."

Two or three disadvantages are, however, to be noted. The coeducational college is more difficult to administer than the separate, and it is the more difficult in proportion to the intimacy of relationship existing between the two sets of students. Different degrees of intimacy are common in coeducation. Simple presence of men and women in common recitation room represent one extreme. The presence, not only in the recitation room, but in the dining hall of the college and in amusements, represents the other extreme. As the intimacy becomes close and personal, the difficulty of administration for deans and presidents greatly increases.

Another disadvantage of coeducation lies in the content of instruction. Certain topics in psychology, in biology, in archæology, which are perfectly proper for presentation to a class of men alone, or to a class of women alone, would offer serious difficulties in presentation to a class of both women and men.

A further consideration which would be reckoned by some as an advantage, and by others as a disadvantage, relates to the college of this type as promoting marriage, or marriage at an early age. On the whole, marriages are more common among women educated in the same coeducational college than among the graduates of the separate women's college. The disadvantage lies, be it added, not in the becoming married, but rather in the becoming married at an age when neither party is quite qualified to assume the obligations of a family.

American life is greatly enriched by the yearly addition of thousands of liberally educated women, most of whom come from the coeducational college. There are at least six advantages which American life receives from such a contribution. First, the college woman adds a mind trained to think. Second, she also brings a heart, sympathetic with all human problems, and yet not over-sympathetic. She is not a merely emotional interpreter of social conditions. With an intellect qualified to think and discriminate, she unites a heart which feels the significance of crises. Third, she is able to offer economic suggestions regarding the processes of government. Fourth, she also helps to supply that vital lack, the need of humanizing industrialism. Fifth, she promotes the giving of a broad freedom for women in all forms of public life and service. In the recent political enfranchisement, the just interpretation and application of such freedom is of special significance. Sixth, she represents the great advantage through her education of the prolongation of the period of youth. The young women of America are liable to begin their life's work at a too early age. Civilization desires that all those who can promote its welfare shall have a proper

degree of maturity. The longer the period of youth, the richer and the more efficient is the contribution which one, coming to maturity, is able to make to worthiest human life and endeavor.

This article has primary reference to colleges of liberal learning. In the professional schools of medicine and of law, women are received more commonly than obtains in the undergraduate college. The progress made in admitting women to professional schools has been especially great in the last decade.

COEFFICIENT, a number or known quantity, prefixed as a multiplier before a known or unknown quantity of letters, into which such quantity or letters are supposed to be multiplied. Thus in the expressions, $4a$, $3ab$, ex, 4 is the coefficient of a, 3 of ab, and c of x.

CŒLENTERATA, the name given to a sub-kingdom of the animal kingdom, the species of which are distinguished from those of humbler organization by possessing a hollow digestive cavity with which the hollow interior of the body freely communicates. The prehensile organs are hollow tentacles disposed in a circle round the mouth. All, or nearly all, are moreover provided with organs of offense and defense, called thread-cells or nematocysts. Professor Huxley places the Cœlenterata between the molluscoida and the protozoa. The sub-kingdom is divided into two classes, actinozoa and hydrozoa. Examples, the corals, the sea anemones, the fresh-water hydra, etc.

CŒLE-SYRIA (that is, "Hollow-Syria"), the large valley lying between the Lebanon and Anti-Lebanon mountain ranges in Syria. Near its center are the ruins of Baalbec.

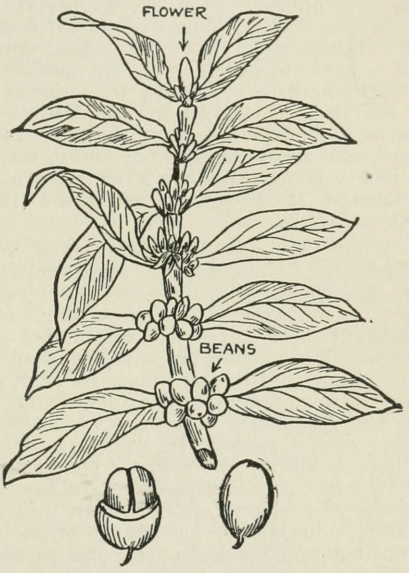
CŒLIAC ARTERY, an artery issuing from the aorta just below the diaphragm. It is called also the Cœliac axis.

CŒLIAC PASSION, a diarrhoea, or flux, that arises from the indigestion or putrefaction of food in the stomach and bowels, whereby the aliment comes away little altered.

CŒUR D'ALENE, a city of Idaho, the county-seat of Kootenai co. It is on the Northern Pacific, the Chicago, Milwaukee and St. Paul, and other railroads. The city has manufactures of lumber, machinery, bricks, and an important trade in fruit and farm products. It is the seat of Cœur d'Alene College and a Catholic academy, and has parks and several handsome public buildings. Pop. (1910) 7,291; (1920) 6,447.

CŒUR DE LION (ker de lē-ôn'), a title given to several historical personages, as Richard I. of England; so-called from the prodigies of personal valor performed by him in the Holy Land; Louis VIII. of France, frequently called *Le Lion;* and Boleslaus I. of Poland, also called "The Intrepid."

COFFEE, the seed of an evergreen shrub which is cultivated in hot climates, and is a native of Abyssinia and of Arabia. This shrub (*Coffĕa arabica*) is from 15 to 20 feet in height, and belongs to the Rubiaceæ. The leaves are green, glossy on the upper surface, and the flowers are white and sweet-scented. The fruit is of an oval shape, about the size of a cherry, and of a dark-red color when ripe. Each of these contains two cells,



COFFEE PLANT

and each cell a single seed, which is the coffee as we see it before it undergoes the process of roasting. Great attention is paid to the culture of coffee in Arabia. The trees are raised from seed sown in nurseries and afterward planted out in moist and shady situations, on sloping ground or at the foot of mountains. When the fruit has attained its maturity cloths are placed under the trees, and upon these the laborers shake it down. They afterward spread the berries on mats, and expose them to the sun to dry. The husk is then broken off by large and heavy rollers of wood or iron. When the coffee has been thus cleared of its husk it is again dried in the sun. A tree in great vigor will produce 3 or 4 pounds.

The best coffee is imported from

Mocha, on the Red Sea. Next in quality to the Mocha coffee may perhaps be ranked that of southern India and that of Ceylon, which is strong and well-flavored and is brought to Great Britain in large quantities. Java and Central America also produce large quantities of excellent coffee. Brazilian coffee stands at the bottom of the list as regards quality. Of the best Mocha coffee that is grown in the province of Yemen little or none is said to reach the Western markets. Arabia itself, Syria, and Egypt consume fully two-thirds, and the remainder is exclusively absorbed by Turkish or Armenian buyers. The only other coffee which holds a first rank in Eastern opinion is that of Abyssinia. Then comes the produce of India, which those accustomed to the Yemenite variety are said to consider hardly drinkable. American coffee holds in the judgment of all Orientals the very last rank. The Dutch were the first to extend the cultivation of coffee beyond the countries to which it is native. By 1718 the Dutch planters of Surinam had entered on the cultivation of coffee with success, and ten years after it was introduced from that colony by the English into Jamaica, and by the French into Martinique.

Coffee as an article of diet is of but comparatively recent introduction. To the Greeks and Romans it was wholly unknown. From Arabia it passed to Egypt and Turkey, whence it was introduced into England by a Turkish merchant named Edwards in 1652, whose Greek servant, named Pasqua, first opened a coffee-house in London. The excellence of coffee depends in a great measure on the skill and attention exercised in roasting it. In the Asiatic mode of preparing coffee the beans are pounded, not ground; and though the Turks and Arabs boil the coffee, they boil each cup by itself and only for a moment, so that the effect is much the same as that of infusion. Coffee acts as a nervous stimulant, a property which it owes mainly to the alkaloid caffeine. It thus promotes cheerfulness and removes languor, and also aids digestion; but in some constitutions it induces sleeplessness and nervous tremblings.

The imports of coffee into the United States in 1919 amounted to 1,046,029,274 pounds, valued at $143,089,619. The consumption per capita in 1918 was 10.29 pounds. The imports in 1919 included 571,921,573 pounds from Brazil, 158,343,135 pounds from Central America, and 121,416,418 pounds from Colombia.

COFFEE BUG (*Lecanium coffæa*), an insect of the coccus family, very destructive in coffee plantations.

COFFEE-HOUSE, a house of entertainment where persons are supplied with coffee and other refreshments. Formerly the chief resort of every class for purposes of conversation and information. It was the central meeting-place of politicians, literary men, etc. Constantinople is believed to have been the first European capital in which coffee-houses were instituted, the year of their establishment there being A. D. 1554. In 1650 the first one in England was opened in Oxford. They were suppressed by Charles II. in 1675, but were soon again allowed to be re-opened.

COFFERDAM, a water-tight inclosure formed by piles driven into the bottom of a river and packed with clay, planks, or other stop-gaps. It is used as a dam while laying bare the bottom of the river, in order to establish a foundation for a pier, abutment, or quay.

COFFER FISH (*Ostracion*), a peculiar genus of bony fishes in the small order *Plectognathi*, and in the family *Sclerodermi*, which also includes the file-fishes. The body is inclosed in a firm box formed of hexagonal bony scales fitted into one another like a mosaic. The best known form is *O. quadricornis* from the tropical Atlantic.

COFFEYVILLE, a city of Kansas, in Montgomery co. It is on the Missouri Pacific, the Atchison, Topeka and Santa Fe, the Missouri, Kansas and Texas, and the St. Louis, Iron Mountain and Southern railroads, and on the Verdigris river. Its industries include planing and flour mills, railroad shops, oil refineries, glass factory, packing plant, brick works, etc. Pop. (1910) 12,687; (1920) 13,452.

COFFIN, the box or chest in which corpses are inclosed before being committed to the ground. Coffins were in use in Egypt at a remote period of antiquity. Some of the Egyptian coffins were wood. There were fine sarcophagi of stone, and in Mesopotamia of clay. Cedar was used in Athens for inclosing the remains of heroes, and marble and stone among the Romans.

COFFIN, CHARLES CARLETON, an American novelist and lecturer; born in Boscawen, N. H., July 26, 1823; began life as a civil engineer; afterward gave his attention to telegraphy. In 1851 he began to write for the Boston papers; and during the Civil War and the Austro-Prussian War of 1866 was war correspondent for the "Boston Journal," writing over the signature of "Carleton." His books include: "Days and Nights on the Battle-Field" (1864);

"Our New Way Round the World" (1869); "Story of Liberty" (1878); "Life of Garfield" (1883); and "The Drum-Beat of the Nation" (1887), the first volume of a series. He died in Brookline, Mass., March 2, 1896.

COFFIN, WILLIAM ANDERSON, an American painter, born in Allegheny, Pa., in 1855. He studied art in the United States and in Paris. In 1882 he opened a studio in New York, where his pictures immediately attracted attention. He was a frequent exhibitor at the Paris Salon, at the National Academy, and other art galleries. He received many prizes for excellence in artistic work. From 1886 to 1891 he served as art critic for the New York "Evening Post," and he filled the same position for the New York "Sun" from 1896 to 1900. He was Director of Fine Arts for the Buffalo Exposition in 1901 and served in many responsible positions on art commissions in the United States and foreign countries.

COGHLAN, CHARLES FRANCIS, an American actor; born in Paris, France, in 1841. He was educated for the bar in London, but went on the stage, making his American début in 1880 as Captain Absolute in "The Rivals." He took leading parts for many years at Wallack's and supporting eminent actors. He wrote "Jocelyn," "Lady Barter," and other plays. He died in Galveston, Texas, Nov. 27, 1899.

COGHLAN, ROSE, an actress; sister to the above; born in Peterboro, England, in 1853. She rose from humble rôles in England to be leading lady, making her American début in 1872. From 1880 to 1889 she was Wallack's leading lady, and since 1893 has been identified with important productions.

COGNAC, (kōn-yak), a town in France, department of Charente; near the river Charente; 22 miles W. of Angoulême. Is famous for the brandy bearing its name.

COGNIZANCE, in Heraldry, a badge in the more restricted sense of that term.

COGNOSCENTI (kōn-yos-chen'tē), persons professing a critical knowledge of works of art, and of a somewhat more pretentious character than amateurs.

COGNOMEN, the hereditary family name such as Cicero, Cato, etc.) among the ancient Romans. The other two names generally borne by every well-born Roman, viz. the *prænomen* and *nomen* (as in Marcus Tullius Cicero), served to denote the individual (Marcus), and the *gens* (Tullius) or clan to which his family belonged.

COGNOVIT, in the law of England, the defendant's written confession that the plaintiff's cause against him is just and true. By this confession before or after issue, the defendant suffers judgment to be entered against him without trial, in which case the judgment is called judgment by confession.

COHAN, GEORGE M(ICHAEL), an American actor and playwright, born in Providence, R. I., in 1878. His first appearance on the stage was made at the age of 9. He appeared in vaudeville with other members of his family for many years. In 1904 he appeared as a star in "Little Johnny Jones," and later in "George Washington, Jr." He was the author of many successful comedies, including "The Yankee Prince" (1909); "Seven Keys to Baldpate" (1913); "Hit-the-Trail Holliday" (1915). He was also a composer of many popular songs, including "Over There," for the writing of which he received a prize of $25,000. This song became extremely popular with the American soldiers and civilians during the World War.

COHESION, the force which unites two molecules of the same nature; as, for instance, two molecules of iron or two molecules of water. It is strongly excited in solids, less strongly in liquids, and not at all in gases. It varies not merely according to the nature of different bodies, but also with the arrangement of molecules in the same body; thus the tempering of steel alters the molecular arrangement in that substance, with the effect also of altering its cohesion. Tenacity, hardness, ductility, etc., arise from modifications in their cohesion.

COHOES, a city of Albany co., N. Y.; at the confluence of the Mohawk and Hudson rivers, and the junction of the Erie and the Champlain canals; and on the New York Central and the Delaware and Hudson railroads; 9 miles N. of Albany. The Mohawk river has a fall of over 70 feet at this point, and supplies unlimited power, making Cohoes a very important manufacturing community.

The Mohawk river is crossed by a dam above the falls, and the water is supplied to the mills and factories by means of canals. The principal manufactures are cotton, woolen and worsted knit goods, foundry and machine shop products, boots and shoes, tobacco, paper boxes, and bread and bakery products.

The city is connected with Albany, Troy, and other neighboring cities by electric street railways. The most note-

worthy buildings are the public library, St. Bernard's Academy, and several of the numerous churches; there were 12 public schools. Pop. (1910) 24,709; (1920) 22,987.

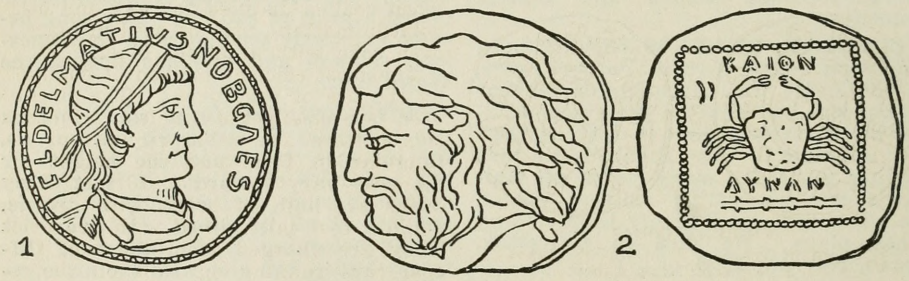
COHORT, a division of the Roman army, the 10th part of a legion, containing three maniples or six centuries. The number of men varied with that of the legion, the 10 cohorts always containing an equal number. When the legion numbered 4,000 men, the cohort consisted of 60 triarii, 120 principes, 120 hastati, and 100 velites, in all 400 men.

COHUNE OIL, a product of the kernel of *Attalēa funifĕra*, a palm-tree found in South America. It resembles cocoanut oil, but is more oleaginous, burning, it is said, twice as long.

COILA, the Latin name of Kyle, Ayr co., Scotland, embalmed in the lyrics of Burns. The word is also used as a fanciful designation for Scotland.

COIMBRA, capital of the Portuguese province of Beira, on a hill above the Mondego river, here crossed by a stone bridge, 135 miles N. N. E. of Lisbon. Its streets are steep and narrow, its manufactures confined chiefly to earthenware and combs. The place derives its name from the Roman *Conimbrica*, traces of which lie to the S.; it was held by the Goths, and from them passed to the Moors, from whom it was finally conquered in 1064, by Fernando the Great, aided by the gallant Cid. Coimbra was the capital of Portugal for about two centuries and a half from its erection into a kingdom, in 1139, and many of the early kings are buried in and around the old town. Of the public buildings, the most noteworthy are the older of the two cathedrals, the Church of San Salvador, and the ruined Convent of Santa Clara; across the river is the *Quinta das Lagrimas* ("House of Tears"), where Inez de Castro was murdered. The University of Coimbra, the only one in Portugal, was originally established at Lisbon in 1288, but was permanently transferred here in 1537.

COIN, a piece of metal on which certain characters are stamped by authority, giving the piece a certain legal current value. Homer speaks of brass money, 1184 B. C. The invention of coin is ascribed to the Lydians, whose money was of gold and silver. Both were coined by Pheidon, tyrant of Argos, about 862 B. C. Money was coined at Rome under Servius Tullius, about 573 B. C. The most ancient known coins are Macedonian of the 5th century B. C. Brass money only was in use at Rome previous to 269 B. C. (when Fabius Pictor coined silver). Gold was coined 206 B. C. Iron money was used in Sparta, and iron and tin in Britain. In the earlier days of Rome the heads were those of deities, or of those who had received divine honors. Julius Cæsar first obtained permission of the Senate to place his portrait on the coins, and the example was soon followed. The Britons and Saxons coined silver.



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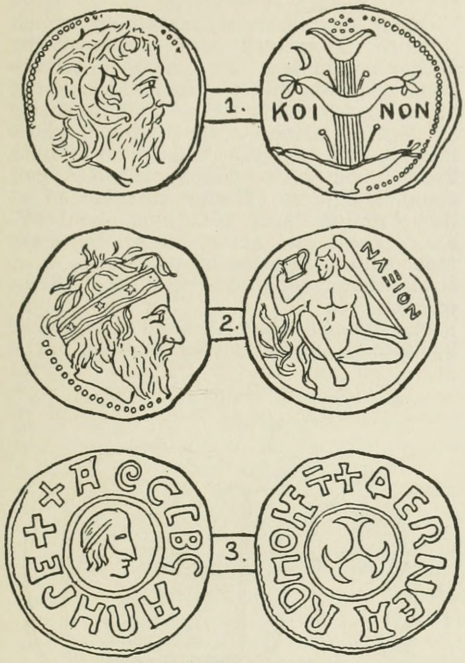
ANCIENT COINS

1. Coin of Dalmatius
2. Coin of Cos.

Fineness of United States Coin.—The gold coins are nine-tenths fine; the silver coins, nine-tenths fine; the copper-nickel coins, such as the 5-cent piece, are one-fourth nickel and three-fourths copper; the bronze coins are 95 per cent. copper and 5 per cent. tin and zinc. The alloy in the gold coins is silver and copper; in the silver coins, copper.

COINAGE, the act or process of coining money. In the United States there is free and unlimited coinage of gold; that is, standard gold bullion may be deposited at the mints in any amount, to be coined for the benefit of the depositor, without charge for coinage; but when other than standard bullion is received for coinage a charge is made for parting, or for refining, or for copper alloy, as the case may be. The depositor receives in gold coin the full value of the

gold in his bullion, less such charges as are specified by law. Subsidiary silver and standard silver dollars, under existing law in the United States, are coined



ANCIENT COINS
1. Coin of Cyrene 2. Coin of Naxos
3. Coin of King Egbert

only on Government account. They are coined from bullion purchased by the Government, and the profits of such coinage belong to the Government. The following table gives the amount and kinds of money coined at the mints of the United States during the fiscal year ended June 30, 1920:

Denomination	Pieces	Value
Gold:		
Double Eagles....	786,250	$15,725,000.00
Eagles.....	126,500	1,265,000.00
Total Gold.....	912,750	$16,990,000.00
Silver:		
Half Dollars.....	6,567,000	$3,283,500.00
Quarter Dollars..	28,426,400	7,106,600.00
Dimes.....	93,735,000	9,373,500.00
Total Silver....	128,728,400	$19,763,600.00
Minor:		
Five Cent Nickel.	91,335,000	$4,566,750.00
One Cent Bronze.	512,607,000	5,126,070.00
Total Minor...	603,942,000	$9,692,820.00
Total Coinage.	733,583,150	$46,446,420.00

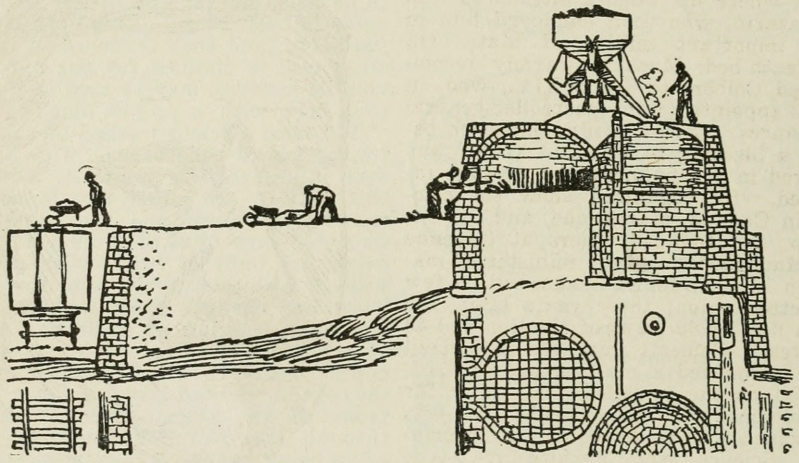
COIR, a material used for small cables, cordage, matting, etc., and consisting of the outer coating of the cocoanut. Cables made of this substance have the peculiarity of making a curve upward between the vessel and the anchor, while a hempen cable curves downward.

COIX, a genus of grasses, tribe *Phalereæ*. *C. lachryma* has hard stony seeds, called Job's tears. They are said to be diuretic and strengthening. It is a native of the East Indies and Japan.

COKE, one of the products of the distillation of coal in ovens and retorts. It bears the same relation to coal that charcoal does to wood. Coke was originally produced by burning coal in piles, with a limited supply of air, much after the modern method of charcoal burning. This plan occasioned a considerable loss of coal, and led to the building of coke ovens, the coke so produced being found to be much harder and denser than that made in open heaps. This open heap or yard-coke, and that produced in retorts, when coal is distilled for gas and other volatile matters, may be used in place of oven coke with a proper blast.

The most efficient method of coking is by the use of coke ovens. The Beehive oven is probably the simplest. Ovens of this pattern are either circular or rectangular in form and the height and diameter vary upward to 10 feet. These ovens are built of brick, with dividing walls 2 feet thick, lined with fire brick. They are charged from the top, from coal cars running on rails on the top of the ovens. The volatile matter escapes through the charging openings and the coke is removed through a door in the front of the oven. Air is admitted through the door for about 24 hours after firing, when all openings are plastered up. The entire process occupies about 36 hours, at the end of which the coke is raked out and quenched with water. The heat required to carry on the combustion is usually obtained by burning the volatile gases given off by the coal. The oven most used in the United States is the Semet-Solvay. This is long and narrow with a door at each end; the roof is supported by heavy masonry. A zigzag flue of four turns runs along each side of the oven, and the gases pass alternately from front to back through the flue to a return flue leading to the chimney at the back. The coal is charged through three charging holes in the roof, which are then closed. The distilled gases pass through an outlet at the end of the roof (the only hole left open), into a hydraulic main, where they mix with the gases from other ovens, and are passed through purifiers for the removal of tar and other con-

densable matter. From the purifier the gas is blown by fans through pipes passing beneath the ovens to branch pipes where it is burned, heating the ovens. The air used in the blast is pre-heated by passing through channels in the heated masonry. The coking lasts about 24 hours, at the end of which time a mechanical ram is brought behind the oven and the coke is pushed out by it to a space in front of the oven where it is quenched. The ram is then withdrawn, the doors closed, and the oven recharged while still hot. Coking is carried on to a large extent throughout the United States, both by the use of ovens and as a by-product of gas producers. The total production of coke in the United States in 1918 was 56,478,372 short tons. The State producing the largest amount was Pennsylvania, with a production of 26,-



BEEHIVE COKE OVEN

123,645 tons. Ohio was second with a production of 5,364,242 tons; Alabama third with 4,352,172 tons; and Indiana fourth with 3,898,215 tons. Other States having a production of over 1,000,000 tons were New York, Utah, and West Virginia. The estimated production in 1919 was 41,821,000 tons. Coke produced in bee-hive ovens in 1919 was 19,-650,000 tons, and the production of coke ovens was 25,997,580 tons. There were imported in 1919 16,486 short tons, valued at $140,653. The exports were 716,-956 tons, valued at $5,128,119. The value of the by-products from coke ovens in 1918 were $74,602,458. The most important by-product was sulphate of ammonia, with a value of $19,061,777. Toluol was produced with a value of $12,249,702, and benzol, with a value of $11,966,367.

COKE, SIR EDWARD, an English lawyer; born in 1551. After finishing his education at Cambridge he went to London, and entered the Inner Temple. He was chosen recorder of the cities of Norwich and of Coventry, knight of the shire for his county, and, in spite of the rivalship of Bacon, attorney-general. As such he conducted the prosecutions for the crown, notably those of Essex and Sir Walter Raleigh. In 1613 he became chief-justice of the Court of King's Bench; but his rough temper and staunch support of constitutional liberties brought him into disfavor with King James and his courtiers. In 1621 Coke was committed to the Tower, and soon after expelled from the privy-council.

In 1628 he was chosen member of Parliament for Buckinghamshire, and greatly distinguished himself by his vindication of the rights of the Commons, and by proposing and framing the famous Petition of Rights. On the dissolution of the Parliament he retired to Buckinghamshire, where he died, in September, 1634. His principal works are: "Reports, from 1600 to 1615," "Institutes of the Laws of England," in four parts; the first of which contains the celebrated commentary on Littleton's Tenures ("Coke upon Littleton"); "A Treatise of Bail and Mainprise," "Complete Copyholder," etc.

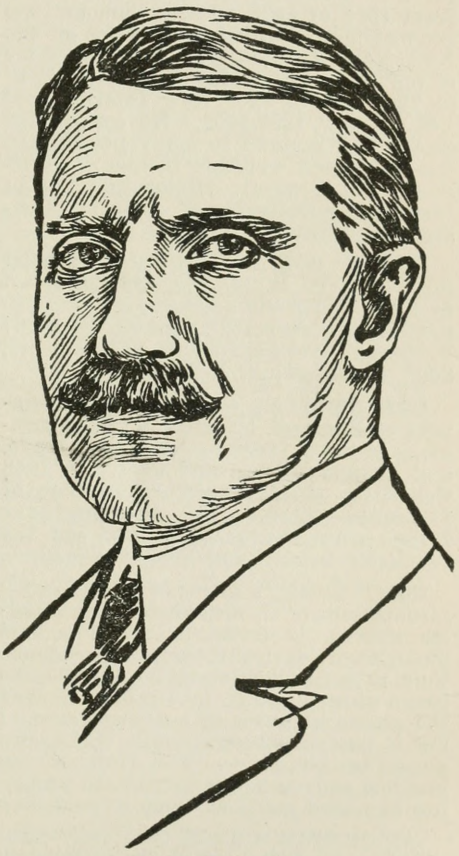
COL ("neck"), in geography, a depression or pass in a mountain-range. In those parts of the Alps where the French language prevails, the passes are usually named Cols—as the Col de Balme, the Col du Géant, etc.

COLBERG, or **KOLBERG**, a seaport and watering-place of Prussia, in the province of Pomerania, on the Persante, near its mouth in the Baltic, 170 miles N. N. E. of Berlin. The principal church dates from 1316. In 1102 Duke Boleslaus of Poland vainly besieged Colberg, which endured long sieges in the Thirty Years' War, in the Seven Years' War, and again in 1807, when it was most gallantly defended against the French. Colberg has manufactures of woolens, agricultural machines, and spirits; and salmon and lamprey fisheries. Pop. about 25,000.

COLBERT, JEAN BAPTISTE (kōl-bār'), Marquis de Seignelay, a French statesman; born in Rheims in 1619. He served his apprenticeship in a woolen-draper's shop, and afterward went to Paris, where his talents introduced him to Mazarin, who soon employed him in most important affairs of state. On his death-bed, Mazarin warmly recommended Colbert to Louis XIV., who, in 1661, appointed him controller-general of finances. Colbert's administration became a blessing to France. Order was restored in the finances, the revenue increased. He organized anew the colonies in Canada, Martinique, and St. Domingo, and founded others at Cayenne and Madagascar. Made minister of marine in 1669, he found France with a few old rotten ships; three years later, she had a fleet of 60 ships of the line and 40 frigates. Colbert improved the civil code, introduced a marine code of laws, as well as the so-called *Code Noir* for the colonies. He did not neglect the arts and sciences. The Academies of Inscriptions, Science, and Architecture were founded by him. In short, Colbert was the patron of industry, commerce, art, science, and literature—the founder of a new epoch in France. He died in 1683. His son, also named Jean Baptiste, born in 1651, succeeded his father as minister of marine, and minister of the king's household. By his capacity and energy, he raised the French navy to its highest power, and in 1684 he led in person the maritime expedition against Genoa. He died in 1690.

COLBURN, ZERAH, an American mathematical prodigy; born in Cabot, Vt., Sept. 1, 1804; displayed such remarkable powers of calculation that in 1810 his father left Vermont to exhibit him. At this period he answered correctly such questions as "How many hours in 1811 years?" in 20 seconds. He was shown in Great Britain, and for some time in Paris; from 1816 to 1819 he studied at Westminster School at the expense of the Earl of Bristol. His father died in 1824, and he returned to the United States, where he served as a Methodist preacher for nine years, and from 1835 was Professor of Languages in Norwich University, Vt., where he died March 2, 1840. His remarkable faculty disappeared as he grew to manhood.

COLBY, BAINBRIDGE, an American public official. Born at St. Louis in 1869, he graduated from Williams College in 1890. After having completed a law course at Columbia University he took up the practice of law in New York City. He was instrumental in bringing about reforms in the affairs of the Equi-



BAINBRIDGE COLBY

table Life Assurance Co. In politics he was actively associated with Roosevelt in the founding of the Progressive party in 1912, but in 1916 supported Wilson for the presidency. President Wilson appointed him a member of the United States Shipping Board, and later made

him a member of the American mission to the inter-allied conference in Paris in November of 1917. When Secretary Lansing resigned in the spring of 1920 the President appointed Colby Secretary of State. During his term many important documents laying down the principles of American diplomacy with relation to the peace settlement with Germany and Russia were issued by his department.

COLBY, FRANK MOORE, an American editor and essayist; born in Washington, D. C., in 1865. He graduated from Columbia University in 1888. For several years he was acting professor of history at Amherst College and was lecturer in history in Columbia University from 1891 to 1895. From 1895 to 1900 he was professor of economics at the New York University. He was editor of the "New International Encyclopedia" in 1898 and of the "New International Year Book," 1898-1902. He contributed essays and reviews to many periodicals. His published writings include: "Outlines of General History" (1900); "Imaginary Obligations" (1904); "Constrained Attitudes" (1910).

COLBY COLLEGE, a coeducational institution in Waterville, Me.; founded in 1818, under the auspices of the Baptist Church; reported at the end of 1919: Professors and instructors, 25; students, 360. President, A. J. Roberts.

COLCHESTER, a borough, and seaport of England, 50 miles N. E. of London. It has a large oyster-fishing trade, and exports of corn and malt. In 1648 Colchester stood a memorable siege of 11 weeks against the Parliamentary forces, who eventually starved out the royalist garrison, and hung the leaders.

COLCHICUM, a genus of plants, order *Melanthaceæ*. *C. autumnale*, the meadow saffron, is found in meadows and pastures of the north temperate regions. To a superficial observer the plant looks like a crocus, and in fact it has received the erroneous name of autumnal crocus; but it has six stamens, while the crocus genus has but three. The corms of the meadow saffron are poisonous, but much use has been made of them in medicine.

COLCHICUM CORM, the fresh corm of *C. autumnale*, or common meadow saffron, which is collected about the end of June, and stripped of its coat, sliced transversely, and dried at 150° F. Used to make extract, an acetic extract, and *Vinum colchici*. According to Garrod, Colchicum increases the flow of the bile, and diminishes the heart's action; it possesses the power of controlling the pain and inflammation in cases of gout and inflammatory rheumatism. The seeds, *Colchici semina*, are used to form a tincture which has the same medicinal properties.

COLCHIS, or COLCHOS, a former country of Asia, to the S. of Asiatic Sarmatia, E. of the Euxine Sea, N. of Armenia, and W. of Iberia. In ancient history it is famous for the expedition of the Argonauts, and for being the birth-place of Medea. In the 15th century it was sub-divided into several principalities, and is now comprised in the Russian government of Trans-Caucasus.

COLCOTHAR, red oxide of iron, ferric oxide, Fe_2O_3. A reddish-brown powder obtained when ferrous sulphate is distilled for Nordhausen sulphuric acid; it remains in the retorts. It is used as a red pigment, and is employed to polish glass, and, when finely divided, by jewelers is known under the name of rouge. It is sometimes called *crocus martis*, and was called *caput mortuum vitrioli* by the alchemists.

COLD, the term by which is signified a relative want of sensible heat. When the atmosphere, or any substance which comes in contact with our body, is at a lower temperature than the skin, it absorbs heat from it, and we call it cold.

The physiological action of cold on the animal organism requires a brief notice. All animals (the warm-blooded animals to the greatest extent) have a certain power of maintaining the heat of the body, in defiance of external cold. This power is mainly due to a process analogous to combustion, in which carbon and hydrogen taken into the system in food are made to unite with oxygen derived from the air by respiration. If the combustible materials are not duly furnished, or if the supply of oxygen be deficient (as in various diseased conditions), there must be a depression of temperature. Now, if the temperature of a bird or mammal (except in the case of hibernating animals) be lowered about 30° below its normal standard (which in birds ranges from 100° to 112°, and in mammals from 96° to 102°), the death of the animal is the result.

In hibernating animals (the marmot, dormouse, bat, etc.) the power of generating heat within their own bodies is very slight.

Cold is applied in various ways in the treatment of disease. In some forms of fever, a cold bath, or cold wet pack, is the best means of reducing a very high temperature which of itself threatens life.

COLDEN, CADWALLADER, an American scientist and colonial official; born in Dunse, Scotland, Feb. 17, 1688. He was graduated from the University of Edinburgh in 1705, and emigrated to the American colonies in 1708. He devoted himself to botany and astronomy and also to public affairs, becoming surveyor-general of New York and president of the council. He sided with the crown in the contest over the stamp act. Among his correspondents were Franklin and Linnæus, and he wrote "Cause of Gravitation" and "History of the Five Indian Nations." He died on Long Island, N. Y., Sept. 28, 1776.

COLD HARBOR, a village in Hanover co., Va., 2 miles N. E. of Chickahominy Creek, and 9 miles N. E. of Richmond. It is noted as the scene of two battles during the Civil War: June 3, 1864, between the Confederates under General Lee and the Federals under General Grant; and a smaller encounter, June 27, 1862, at Gaines' Mill, at this place.

COL DI LANA, a pass in the Alps of Trentino captured in a forward attack on the Austrians by the Italians, on April 17, 1916. It was retaken by the Austrians during the drive down the Trentino in May, which was not stopped by the Italians till the middle of the following month at the northern edge of the Val d'Assa and the Asiago basin.

COLD STORAGE, the method now generally employed to preserve perishable articles of food by the air of freezing machines, which reduce the temperature of the air. Cold storage warehouses are found in all large cities, and have proved of great value in keeping fruits and meats in an unchanged condition from one season to the other. This method is also used on cars and ships transporting perishable material

COLDSTREAM, a town of Berwickshire, Scotland, 15 miles S. W. of Berwick, on the Tweed, over which there is a fine bridge by Smeaton (1766). At Coldstream was the famous ford by which Edward I. entered Scotland in 1296, and near which he met the Scottish nobles, to settle the dispute about the crown of Scotland. By this ford also the Scots invaded England in 1640. Being convenient as a border town, Coldstream, like Gretna Green and Lamberton tollbar near Berwick, was formerly celebrated for its clandestine marriages.

COLDWATER, a city and county-seat of Branch co., Mich., on Coldwater river, and the Lake Shore and Michigan Southern railroad, 156 miles E. of Chicago. The Coldwater river supplies power for the various manufacturing establishments. It is the seat of the State School for Dependent Children, and has a park, two libraries, a high school, several newspapers, and National banks. Pop. (1910) 5,945; (1920) 6,114.

COLE, THOMAS, an American landscape painter; born in Lancashire, England, Feb. 1, 1801. His father, a woolen manufacturer, came to the United States when Thomas was 18 years old, and settled in Steubenville, O. Thomas worked in his father's shop for two years, but the coming of a portrait-painter to the village made him wish to be an artist. After a few lessons he set to work to paint pictures, and traveled for a while painting portraits and landscapes. In New York, by hard work, he succeeded in becoming one of the best American landscape painters. He was enabled to go to Europe and study the old masters. Among his best pictures are the five called "The Course of Empire" and the four "The Voyage of Life." He died in Catskill, N. Y., February, 1848.

COLE, TIMOTHY, an English wood-engraver; born in London, April 6, 1852. He early came to the United States, and established himself as an engraver, first in Chicago, and afterward in New York, where he pursued his calling with much success. In 1883 he went to Europe, and began a series of engravings from the old masters. A series of the old Italian masters was completed in 1892; of the Dutch-Flemish in 1896; of English, 1900; of old Spanish masters, 1902-1907; of French, 1910. From 1914 he was engaged on engravings of paintings in American galleries. He received first-class medals from every exposition since 1893. He was author of "Notes on the Old Italian Masters" (1892); "Monograph on Lives of Dutch Masters" (1896); "Notes on English Masters" (1901).

COLENSO, JOHN WILLIAM, an English clergyman; born in Cornwall, Jan. 24, 1814. In 1846 he was appointed rector of Forncett St. Mary, in the county of Norfolk, and 1854 first Bishop of Natal, South Africa. In the next year appeared his "Ten Weeks in Natal"; in 1861 his "Translation of the Epistle to the Romans Commented on from a Missionary Point of View"; and "A Letter to His Grace the Archbishop of Canterbury upon the Question of the Proper Treatment of Cases of Polygamy, as Found Already Existing in Converts from Heathenism." The outcry raised by his professional brethren against the "Letter" was sufficiently loud, but it was nothing to the tempest of disapproba-

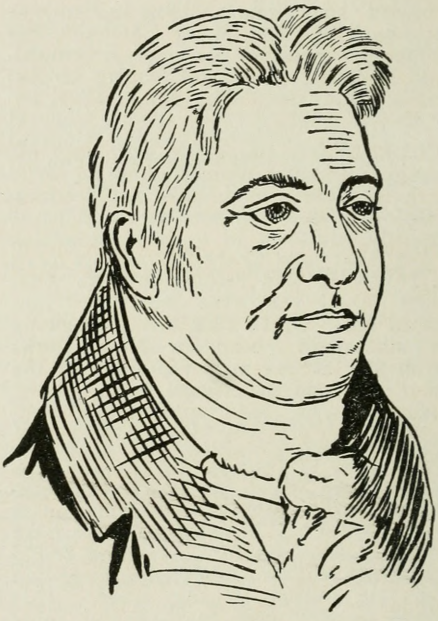
tion that burst forth in the following year (1862), when he published "The Pentateuch and Book of Joshua Critically Examined." The Bishop of Cape Town, the metropolitan Bishop, declared Colenso deposed from his see; but on an appeal to the Privy Council, in 1865, the deposition was pronounced null and void. Colenso wrote treatises on mathematics used as text-books. He died in Durban, Natal, June 20, 1883.

COLEOPTERA, an order of insects which has been recognized since the days of Aristotle. The number of species enumerated by naturalists, and of which examples are gathered in museums, amounts to 100,000. The Coleoptera are sometimes collectively called beetles, and many of them are known as weevils, lady-bugs, etc. The glow-worm and the blistering-fly belong to this order.

COLERIDGE, HARTLEY, an English poet and critic, son of Samuel Taylor Coleridge; born in Bristol, in 1796. From Oxford he went to London, and there published some exquisite sonnets in the "London Magazine." He inherited defects of character and will, and never realized the promise of his great talents. His writings in prose are "Biographia Borealis" (1833); "The Worthies of Yorkshire and Lancashire" (1836); and a volume of "Essays and Marginalia." His brother Derwent published a biography and his poems. He died in 1849.

COLERIDGE, SAMUEL TAYLOR, an English poet and philosopher; born in Ottery St. Mary, Devonshire, Oct. 21, 1772. Sent to school at Christ's Church Hospital, he was noted for a dreamy abstracted manner, though he made considerable progress in classical studies. From Christ's Church he went with a scholarship to Jesus College, Cambridge. His ultra-radical and rationalistic opinions made the idea of academic preferment hopeless, and perhaps to escape the difficulties gathering about his future, Coleridge suddenly quitted Cambridge and enlisted in the 15th Dragoons. Rescued by his friends from this position, he took up his residence at Bristol with Robert Southey, who had just been obliged to quit Oxford for his Unitarian opinions, and Lovell, a young Quaker. The three conceived the project of emigrating to America, and establishing a pantisocracy, as they termed it, or community in which all should be equal, on the banks of the Susquehanna. This scheme, however, never became anything more than a theory, and was finally disposed of when, in 1795, the three friends married three sisters, the Misses Fricket of Bristol. Coleridge about this time started a periodical, the "Watchman," which did not live beyond the ninth number.

In 1796 he took a cottage at Nether Stowey, in Somersetshire, where, supported by the companionship of Wordsworth, he wrote much of his best poetry, in particular the "Ancient Mariner" and the first part of "Christabel." While residing at Nether Stowey he used to officiate in a Unitarian chapel at Taunton. An annuity bestowed on him by some friends (the Wedgewoods) furnished him with the means of making a tour to Germany, where he studied at the University of Göttingen. In 1800 he



SAMUEL TAYLOR COLERIDGE

returned to England and took up his residence beside Southey at Keswick, while Wordsworth lived at Grasmere in the same neighborhood. About 1804 Coleridge went to Malta to re-establish his health, seriously impaired by opium-eating. In 1806 he returned to England, and after 10 years of somewhat desultory literary work as lecturer, contributor to periodicals, etc., Coleridge in a way took refuge in the house of his friend Mr. Gillman at Highgate, London. Of the many years he spent here nothing remains but the "Table Talk." He died July 25, 1834. The dreamy and transcendental character of Coleridge's poetry eminently exhibits the man. As a critic, especially of Shakespeare, his work is of the highest rank. Coleridge's

poetical works include "The Ancient Mariner," "Cristabel" (incomplete), "Remorse," a tragedy; "Kubla Khan," a translation of Schiller's "Wallenstein," etc. His prose works, "Biographia Literaria," "The Friend," "The Statesman's Manual," "Aids to Reflection," "On the Constitution of Church and State," etc. Posthumously were published specimens of his "Table Talk," "Literary Remains," etc.

COLERIDGE-TAYLOR, SAMUEL, an Anglo-African composer; born in London, Aug. 15, 1875. His father was a native of Sierra Leone and his mother an English woman. He composed many successful songs and waltzes and an operetta entitled "The Dream Lovers." He conducted orchestral concerts in several English cities, and made tours in the United States in 1904, 1906, and 1910. He died in 1912.

COLESEED a name for a variety of cabbage (*Brassica Napus*), and its seed, which is made into oil-cake for feeding cattle.

COLE-WORT, the common cultivated cabbage (*Brassica oleracea*); called also collet.

COLFAX, SCHUYLER, an American statesman; born in New York, March 23, 1823; removed in 1836 to Indiana. He was a delegate to the Whig conventions of 1848 and 1852; was elected to Congress in 1854 by the newly formed Republican party, and re-elected until 1869, being thrice chosen Speaker; and in 1868 he was elected vice-president of the United States, in Grant's first term. Implicated, unjustly, as he and his friends claimed, in the Credit Mobilier charges of 1873, he spent the remainder of his life in political retirement. Died in Mankato, Minn., Jan. 13, 1885.

COLGATE UNIVERSITY, an educational institution in Hamilton, N. Y.; organized in 1819, under the auspices of the Baptist Church; reported at the end of 1919: Professors and instructors, 44; students, 599; volumes in the library, 85,000; income, $193,353; president, Elmer Burritt Bryan.

COLIBRI, a name for various species of humming-bird.

COLIC, a name employed by the later Greek and the Roman physicians to denote diseases attended with severe pain and flatulent distention of the abdomen, without diarrhœa or looseness of the bowels. The disease is now generally believed to be spasmodic in character, and to be dependent upon irregular contractions of the muscular coat of the intestines. Colic almost always ends in recovery, preceded by free evacuation of the bowels. Purgatives, therefore, should be given combined with sedatives. A suppository or hypodermic injection of morphia may secure immediate relief from pain before aperients have time to act. Mustard plasters, turpentine stupes, and hot-water fomentations are also useful.

COLIGNI, or **COLIGNY, GASPARD DE CHÂTILLON**, (kō-lēn'yē), **SIRE DE**, admiral of France, and leader of the Huguenots in the civil war; born in 1517. His father, also named Gaspard, was Marshal of France, and took part in the invasion of Italy by Charles VIII., and in the conquest of the Milanese by Louis XII. and Francis I. His mother was a Montmorency. He entered the army at an early age, distinguished himself at the battle of Cerisole, at the taking of Carignan, and at the battle of Rentz. He was made Admiral of France in 1552, by Henry II. At the siege of St. Quentin he was taken prisoner by the Spaniards. On the death of Henry II. he returned to his estates, became a convert to the reformed faith, and when the war broke out put himself at the head of the Protestants, with the Prince of Condé. They were defeated by the Duke de Guise at the battle of Dreux; the indecisive battle of St. Denis followed, and the Protestants were defeated at Jarnac, and Moncontour. In 1570, after the treaty of St. Germain, Coligny was flatteringly deceived by Catherine de Medici, and a few days later his assassination was attempted by an emissary of the Duke de Guise. The King, Charles IX., visited him and professed his regret. On the signal being given for the massacre of St. Bartholomew, Aug. 24, 1572, De Guise, with a party of assassins, went to the house of the Admiral; by these he was stabbed and thrown out of a window at the feet of the duke. The corpse was exposed for three days to the mob, and then hung head downward.

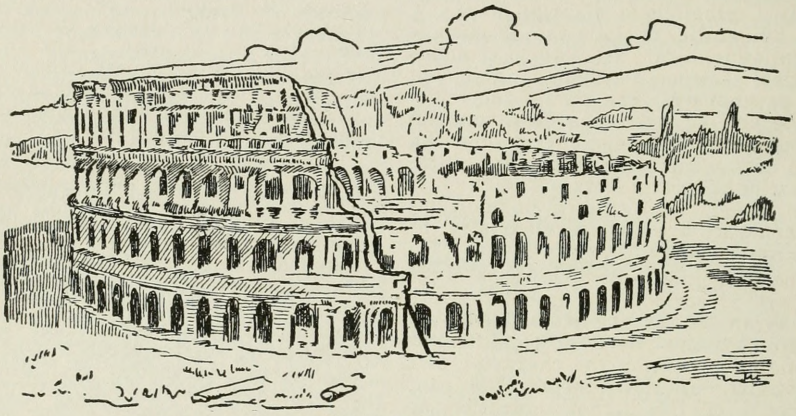
COLIMA (kō-lē'mä), a Mexican State on the Pacific coast, with an area of 2,272 square miles, and a pop. of about 80,500. The soil is very fertile, the climate warm; large quantities of coffee, sugar, rice, tobacco, maize, and cotton are grown. The capital, Colima, 1,450 feet above the sea, about 40 miles E. N. E. of the port of Manzanillo, has several cotton factories. Pop. about 26,000.

COLISEUM, the Flavian amphitheater at Rome, built by the Emperors Vespasian and Titus. It seated 80,000 per-

sons, and was adorned with columns of the three Greek orders of architecture. It is the most imposing ruin in the world.

COLLAR-BONE, the clavicle; a bone situated on either side of the neck. The one is called the right, the other the left clavicle.

COLLATINUS, the husband of Lucretia, who, in conjunction with Brutus, expelled the Tarquin family from Rome, and established the consular government.



COLISEUM AT ROME

COLLECT, a name given to certain brief and comprehensive prayers, found in all liturgies and public devotional offices. The origin of the term is not certain; according to some, it is from these prayers being said in the congregation or collection of the people. They are of great antiquity, and occur in the sacramentary of Gelasius, patriarch of Rome, A. D. 494.

COLLECTIVE BARGAINING. See LABOR ORGANIZATION.

COLLECTIVISM, a word of quite recent origin, intended to express the central idea in the economic theory of socialism, that industry should be carried on with a collective capital. It means that capital should not be owned and controlled by individuals, but by groups of associated workers; the joint property of the community.

COLLEGES. Three forms of the institutions of the higher education are easily distinguished. The earliest was the private, or ecclesiastical. By this method a few citizens, usually members of a church, associated themselves for the purpose of securing a charter from the government of the State in which it was desired to establish a college. Under either a special act of the legislature, or under the general law, was the actual corporation secured. The college thus established was usually of a denominational or sectarian type. A second form is found in a method which is still personal, but without special religious affiliation. Leland Stanford University, California, is an example. The third form is what is known as the State university, an institution established in the individual commonwealth and as a crown to its public school system. It is supported out of the public funds raised by taxation. Its government is vested in a board of regents or trustees, either appointed by the governor or elected by the people. At least 40 such universities are found in the United States.

In the government of each college or university are usually associated two bodies, the one called trustees, or directors, or overseers, or regents, or fellows, who represent the legal side of the corporation. The other is called the faculty, which is the body of instruction. These two bodies work in co-operation in carrying on the essential service of the institution.

To the college, or to the undergraduate department of the university, students are admitted from the high school or the academy. The average age is 18, plus. The direct preparation consists in studies embodying English literature and language, mathematics, solid geometry, either Latin or French or German and occasionally Greek, pursued for four years; history, either ancient or modern, and an elementary knowledge of chemistry and physics. The students of the age of 18 enter college usually, though not always, with a direct purpose. To prepare themselves for a profession was formerly a primary purpose. It is now

not the only purpose. The preparation for business, for engineering, for journalism, for farming, has, however, in recent years become an aim not unusual.

The studies which are pursued on entering the four years' course are easily divided into the old humanities, the new humanities, and the sciences. The old humanities were primarily Latin and Greek. These have in recent decades, especially Greek, become largely eliminated for modern linguistic studies. French or Spanish have been substituted. Formerly German held a large place. The new humanities include the English language and literature, history, economics, political science, sociology, philosophy, and psychology. The rise of the sciences in the last 70 years has been constantly reflected in the college curriculum. They have now assumed an important place as educational instruments. The chief subjects in this field studied in addition to mathematics are physics, chemistry, biology, and geology.

The principle on which these studies, in part prescribed and in part elective, are arranged for the student are, first, to promote the power of thinking, and, secondly, to develop the character of the individual. In the interpretation of the purposes of the higher education such phrases as "Education is self-unfolding," "Education seeks to train leaders in democracy," "Education endeavors to form the character as well as to discipline the mind," "Education is aimed to secure rational living," "Education is to help one to enjoy one's self," "Education is a preventive of evil and a promotion of the good," "Education is designed to develop the individual and to incorporate this individual into the whole community," "Education is a process of laying up capital, both intellectual and ethical," are constantly used.

In addition to the scholastic feature of the college and the university, is found a very vital undergraduate life. This life is composed of manifold associations. First among them is the system of fraternities—brotherhoods, organized for social purposes—not a few of which are intercollegiate. Houses, either owned or leased, are the homes of these organizations. Next to them the highest place is occupied by athletic sports, including football, baseball, basketball, hockey, tennis, and many other sports. Dramatic associations, musical societies, debating clubs, literary organizations, civic clubs, Young Men's Christian Associations, and Young Women's Christian Associations, daily and weekly papers, monthly magazines, parliamentary associations, represent happy and, in many relations, profitable forms of undergraduate activity.

American Colleges.—The history of American colleges may be divided into three periods—the colonial college, the old American college, and the new American college. The colonial college ended with the American Revolution; the new American college begins about the year 1870 and is still in process of evolution.

Before the Revolutionary War there had been a continuous development of higher education in the colonies for 150 years. The point of beginning was the institutional life already familiar in the home beyond the seas. Harvard College, established by a bequest from John Harvard in 1638, was a combination of an English public school and Emmanuel College. It was founded as the "schoole and colledge at Newton." Yale in 1701 was founded as a "collegiate schoole," and Dartmouth grew out of Dr. Wheelock's School for the Indians. Altogether 11 institutions of higher learning were founded before the Revolution. These were all very poor. Yale's annual budget after 25 years of labor was 315 pounds, no part of which sum came from endowment. After a century and a half of history Harvard's total funds were less than 17,000 pounds. William and Mary was the richest of our early colleges. Its main building was a handsome brick edifice, 136 feet in length, whose architect was Sir Christopher Wren.

The avowed purpose of these earliest colleges was the training of leaders for the Christian ministry. One-half the graduates of Harvard for the first 100 years entered the ministry. After the Revolutionary War the field of their educational service altered materially. Their task was to train leaders, not for the church alone, but for a new state, for a commercial life beginning to express itself in new callings, for a period of pioneer development sweeping across the continent. The old colleges were strengthened and a number of new ones founded. The States began to assume a direct responsibility in this work. The University of North Carolina was chartered in 1795, Vermont in 1800, Georgia in 1801, and South Carolina in 1805. Still progress was slow. Dexter estimates that in 1800 all existing colleges in the country had less than 2,000 students, hardly more than 100 professors, and $1,000,000 worth of property.

During the period now under discussion all American colleges developed along similar lines. The course of study was rigidly prescribed, based on Latin and Greek as fundamentals, to which

were added English literature and rhetoric, mathematics, logic and philosophy, with a little history. After four years of work the degree of A. B. was given. Between 1800 and 1870 8 new subjects were introduced into the admission requirements, viz., English grammar, English composition, algebra, geometry, geography, ancient history, United States history, and physical geography.

Within the last 50 years the American college has developed greatly along many lines. Some problems it has solved, many are still in process of solution. Its present status may be discussed under separate heads:

1. *Material Resources:* It is not easy to fix a definite standard of wealth as an essential condition of college organization. The Association of American Colleges has published a suggestive bulletin on "The Efficient College." The conclusion is that "an efficient college of 400 students should have a faculty of 40 teachers, total assets of about $3,000,000 and an annual income of about $125,000." At present this standard is ideal. A few of our best colleges reach it, but they have usually more than 400 students. The North Central College Association requires an endowment of $200,000 and this has been generally accepted by standardizing agencies as a minimum. But the enforcement of even this moderate provision would forfeit the charters of a large proportion of the institutions calling themselves colleges. But it should be said that these feeble institutions with little or no endowment or source of income other than student fees are not examples of the modern American college. They are left-over examples of the old-fashioned or even of the colonial college. No modern college can escape the financial burden involved in providing scientific laboratories, and a well-filled library carefully administered.

From the standpoint of material resources we may recognize several distinct types of colleges. First, there is the small college with a faculty of 8 or 10, a student body of less than 200, and a limited election of work. Then there is the large college, still detached, with larger resources of every kind. Then there is the university college—a college still—the center of a university that offers professional work of the most varied character. Apparently the student trend is toward these large institutions.

2. *General Purpose:* Long ago the college ceased to be vocational, as were the earliest institutions in America. The next rallying point was the call for intellectual discipline. This end and aim of the college course was elaborately defended in 1827 in a report made by the Yale faculty. With this argument every college defended its rigid technical course of study. With the expansion of the curriculum, made necessary through the expansion of knowledge and made possible through the expansion of material resources, the college relaxed its claims for the supremacy of mental discipline and abandoned its rigid curriculum for securing the same. For discipline it substituted "culture," returning to the humanitarian ideas of the renaissance. This ideal of culture has been weakened by attacks from two sides. A report of the Harvard faculty in 1904 says: "The easiest way to induce students to take a subject for culture is to make it not too difficult." There has also been a demand that the college course relate itself to the life purposes of the students. This has been heeded, especially by colleges attached to large universities, so that the college course is again becoming vocational.

3. *The Curriculum:* Perhaps the greatest academic struggle of the past generation has been carried on over the college curriculum, the introduction of new subjects, the adherence to old requirements, the adoption of a system of free electives or parallel courses, the length of the course and the degrees that should crown it. The whole question is older than 1870. It was brought distinctly to the front in the founding of the University of Virginia in 1825. Harvard, under the leadership of President Eliot, was the center of the liberal influence. Out of the confusion and strife there are some broad conclusions that may be stated: (a) The rigid college course is gone and will not be restored. (b) New subjects and new courses are introduced by every college to the extent of its financial ability, and beyond. Limitations are financial alone, not of educational theory. (c) Free election is making little progress at present. A corrective is applied by some form of parallel courses or group studies or requirement of majors and minors. (d) Admission requirements become constantly more liberal with the ultimate goal that no student is to be rejected—at least by the larger State universities—who has finished an acceptable high school course. (e) The typical course is to occupy four years, but some students will accomplish it in three and most professional students will have their first year credited as part of their college course. (f) The degree of A. B. will be the usual degree for any course. Some institutions will continue to give B. S., but other degrees, as B. L., or Ph. B., will be abandoned.

4. *Extra Curriculum Activities:* These cannot be omitted in any account of the present American college. There has been a tremendous and not altogether desirable growth of non-scholastic interests in college life. These interests attract students more than scholarship. As yet they have not been properly organized and vitalized with the spirit of culture. Athletics, fraternities, and social life are now ahead of any study in the curriculum.

From the foregoing it appears that no definition of the term "college" has yet secured general acceptance. At the same time influences are working from many quarters looking to the establishment of certain minimum attainments, financial, and educational, that every college must possess. These are an endowment of at least $200,000, or an annual income from taxes of $40,000, not less than eight departments, each having at least one full-time professor, regular appropriations for laboratories and library, and satisfactory salaries. Some States limit the granting of charters by some such provisions and educational societies have urged such limitation as a universal requirement.

The future of the American college has been much discussed. The college is threatened by the high school and junior college on the one side and by the university and professional schools on the other. None the less the American college—even the detached cultural college—survives to-day and is being strengthened. It has no counterpart either in England or on the Continent of Europe. It has inherited respect and affection accumulated through hundreds of years and in spite of many changes still remains in some respects our most typical American educational institution.

COLLÈGE DE FRANCE, a celebrated institution founded by Francis I., in 1530, originally a *Collège de Trois Langues* merely, is now a very important educational institution, giving instruction over a very wide field of literature, history, and science. It is independent of the University of France, is directly under the Minister of Public Instruction, and is supported by the government. As in the Sorbonne, the lectures are gratuitous. The College comprises two faculties, one literary, one scientific; each has about 20 professors.

COLLEGE FRATERNITIES, societies existing in American colleges which are named from the letters of the Greek alphabet and therefore commonly called "Greek Letter Societies." They are secret organizations only in their grips and passwords. They are organized chiefly for literary and social purposes and are found among women students as well as men. The first of these fraternities, the Phi Beta Kappa, was organized at William and Mary College, in Virginia, in 1776. On account of the troubled state of the colony during the Revolutionary War, the original chapter ceased to exist in 1781, but branches, or "chapters," as they are called, had already been established at Harvard and Yale, and by these other branches were afterward organized. It still exists as the chief society, indicating scholarly distinction in 50 different colleges. Of the general fraternities now in existence the first, the Kappa Alpha, was founded at Union College in 1825. There are women's college fraternities, the oldest being the Pi Beta Phi, founded at Monmouth in 1867. A number of journals are published by the societies, the oldest still in existence being the "Beta Theta Pi," established in 1872. The oldest women's journal is the "Golden Key," established by Kappa Kappa Gamma in 1882, now known as the "Key."

COLLEGE OF THE CITY OF NEW YORK, an educational (non-sect.) institution in Manhattan Borough, N. Y.; organized in 1848; reported at the end of 1919: Professors and instructors, 270; students, 10,763; president, S. E. Mezes.

COLLEGES FOR WOMEN, institutions of higher learning, designed to give women practically the same advantages of instruction and research as are afforded to men. They are of three types: independent or separate colleges; co-ordinate or affiliated colleges, connected more or less closely with an older college for men, and coeducational colleges.

I. Independent colleges for women of the same grade as those for men are peculiar to the United States. The earliest foundation was Mount Holyoke College, opened as a seminary in 1837; reorganized as a college in 1893. The first charter for a collegiate institution founded only for women was granted Elmira College in 1855. The four colleges, Vassar, opened in 1861; Smith, in 1875; Wellesley, in 1875, and Bryn Mawr, in 1885, are ranked among the leading colleges of the United States.

II. The affiliated colleges for women are five: Radcliffe College, at Harvard University, opened in 1879; Barnard College, at Columbia University, in 1889; Woman's College, of Brown University, in 1892; College for Women, of Western Reserve University, in 1888; Sophie Newcomb Memorial College, at Tulane University, in 1886. In all these colleges the standards of entrance and graduation are the same as in the men's col-

leges with which they are affiliated, and usually the instructors are the same.

III. The prevailing system of education in the United States for both men and women began in Oberlin College, in Ohio, founded in 1833, chartered as a college in 1850, built "for the education of both sexes and all colors." Antioch College, also in Ohio, followed in 1853, by admitting both men and women on equal terms. In 1900 every State university in the country, except those of Virginia, Georgia, and Louisiana, admitted women.

Many professional schools and colleges have been opened to women in theology, law, medicine, dentistry, pharmacy, schools of technology and agriculture, and the number of women entering these professions is increasing rapidly.

In Europe the advance in this direction has been much slower. The first woman's college in Cambridge, England, was begun in 1869. Now Oxford and Cambridge give large opportunities to women, but do not confer upon them their degrees. With these exceptions, all the greater English and Scotch universities and colleges in Great Britain and in her colonies give their degrees to women.

COLLIER, JEREMY, an English clergyman and political writer; born in 1650. He was educated at Cambridge, and having taken orders became rector of Ampton in Suffolk in 1659. He is chiefly remembered now for his "Short View of the Immorality and Profaneness of the English Stage," a work which effected a reform in the sentiments and language of the theater. He died in 1726.

COLLIER, JOHN PAYNE, an English Shakespearean critic; born in London in 1789. He became known as a critical essayist on old English dramatic literature, and was editor of the new edition of "Dodsley's Old Plays" in 1825. In 1831 his best work, the "History of English Dramatic Poetry," was published. In 1842-1844 he published an annotated edition of Shakespeare in 8 vols.; in 1844 "Shakespeare's Library"; and in 1862 an edition of Spenser. He died in 1883.

COLLIER, PETER FENELON, an American publisher and philanthropist, born in County Carlow, Ireland, 1849. He removed with his parents to the United States, settling in Cincinnati, and his formal education was completed in St. Mary Seminary in that city. He began his business career in New York City early in the seventies, selling books from door to door. He purchased in 1882, for a small sum, a complete set of the plates of an edition of Dickens' works. Purchasing a printing press, he began the publishing business which within a few years had become very successful. The firm of P. F. Collier & Son published and sold many millions of books, chiefly editions of standard authors, made in inexpensive form. He founded in 1888 "Collier's Weekly." Mr. Collier was well known as a sportsman and breeder of blooded horses. He died April 23, 1909.

COLLIER, ROBERT JOSEPH, an American editor and publisher, son of Peter Fenelon Collier, born in New York City in 1876. He graduated from Georgetown University in 1894 and took post graduate studies at Oxford and Harvard Universities. On the death of his father he became head of the publishing firm of P. F. Collier & Son, and for a time was editor of "Collier's Weekly." He initiated the formation of the Lincoln Farm Association, which by popular subscripton raised funds for the purchase of the farm upon which Lincoln was born in Kentucky, and the erection of a granite memorial which inclosed the Log Cabin on the farm, This memorial was formally accepted by the United States Government in 1916. Mr. Collier was a member of many societies and took a prominent part in relief work during the World War. He was a well-known sportsman. He died suddenly, Nov. 9, 1918.

COLLIER, WILLIAM, an American comedian, born in 1868. He appeared in many minor parts in various comedies until 1901, when he became a star in "On the Quiet." He afterward appeared as star in many comedies and became one of the best known and most popular of American comedians.

COLLIER, WILLIAM MILLER, an American educator and diplomat; born in Lodi, N. Y., in 1867. He graduated from Hamilton College in 1889 and studied at the Columbia Law School in 1889-1890. He was admitted to the bar in 1892. After practicing for several years in New York City he was appointed a member of the State Civil Service Commission, serving as president of that body from 1901 to 1903. He was lecturer on the law of bankruptcy at the New York Law School from 1903 to 1905. In 1903 he was appointed by President Roosevelt as special assistant of the attorney-general of the United States. He was appointed solicitor-general of the United States in 1904. From 1905 to 1909 he was minister to Spain. In 1917 he was elected president of George Washington University. During the World War he was

chairman of the Extension Committee of the Red Cross at Cayuga co., N. Y., and took part in the war-loan campaigns. He wrote several works on legal subjects, including "Collier on Civil Service Law" (1901); "The Trusts" (1900); and "The Law and the Higher Law" (1918).

COLLIMATION, the act of aiming or pointing toward any object. The line of Collimation of a telescope is that from the optical center of the objective to the middle wire, or to the mean of the wires of a transit, or to the zero-position of the micrometer-wires in an instrument for measuring zenith-distances. The Error of Collimation of a transit is the departure of this line from a direction at right angles to the axis. The Collimation Correction is the amount to be applied to the observed times of transit to correct them for this error.

COLLIMATORS, telescopes used for the determination of the corrections of collimation, for flexure, or for the zenith-point of a meridian-circle or transit. They are generally fixed upon piers N. and S. of the instrument and pointed toward each other and toward the instrument itself when in a horizontal position. They are adjusted so as to be intervisible when the instrument is lifted out of its Y's, and, on looking into either, the wires of the other are seen alongside those in the field, so that they can be pointed on each other, or the instrument itself upon either in turn. Besides the above arrangement there are many others, and also other uses of Collimators. Very often a long focus lens with a distant meridian-mark takes the place of one of the Collimators, and it is then used also as a reference point for the azimuth-correction of the instrument.

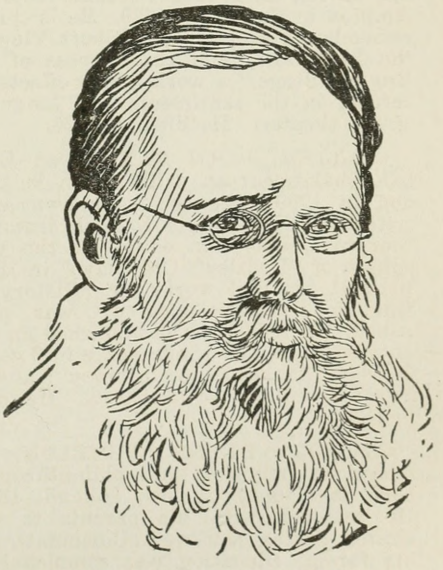
COLLINGWOOD, CUTHBERT, LORD, an English naval commander; born in Newcastle-upon-Tyne in 1750. He entered the royal navy in 1761, and took part as flag-captain on board the "Barfleur" in Lord Howe's victory of June 1, 1794, commanded the "Excellent" during the battle off Cape St. Vincent on Feb. 14, in that year, and was made rear-admiral of the white in 1799. His most distinguished service was at Trafalgar, where he won the praise of Nelson. On the latter's death Collingwood as senior officer took command of the fleet. For his services here he was elevated to the rank of baron. He died, while cruising off Minorca in the "Ville de Paris," on March 7, 1810. His "Memoirs and Correspondence" have been published.

COLLINS, JOHN CHURTON, an English educator and writer, born in 1848. He graduated from Balliol College, Oxford, in 1872. For many years he contributed book reviews and criticisms to the English reviews. In 1904 he was appointed professor of English literature at the University of Birmingham. He edited many editions of English classics and wrote "Sir Joshua Reynolds as a Portrait Painter" (1874); "Study of English Literature" (1891); "Essays and Studies" (1895); "Essays in Poetry and Criticism" (1905); and "Rousseau and Voltaire" (1908). He died in 1908.

COLLINS, WILLIAM, an English poet; born in Chichester, Dec. 25, 1721. His melancholy temperament and poetic musings marked him as a boy, and at Oxford. "The Passions," the "Ode to Evening," the "Dirge in Cymbeline," and the "Ode on the Death of Thomson," chiefly perpetuate his fame. He died in a madhouse at Chichester, June 12, 1759.

COLLINS, WILLIAM, an English painter; born in London, Sept. 8, 1788; father of William Wilkie Collins. His most popular works are: "Happy as a King," "The Stray Kitten," "Putting Salt on the Bird's Tail," and "The Newly Found Nest." He died in London, Feb. 17, 1847.

COLLINS, WILLIAM WILKIE, an English novelist; born in London, Jan. 8, 1824. He was educated at a private school. After a short time in the tea-trade he studied law at Lincoln's Inn. He wrote a biography of his father in 1848 and made literature his profession.



WILLIAM WILKIE COLLINS

His first novel was "Antonina" (1850); "Rambles Beyond Railways" follow. In 1852 he returned to fiction with "Basil," and "Mr. Wray's Cash Box," "Hide and Seek" followed in 1854. In "Household Words," "After Dark" and one of his most successful works, "The Dead Secret," were originally published.

Several of his novels, including "The Woman in White" and "No Name," were published originally in "All the Year Round." "Armadale" and many of his subsequent stories were printed in American magazines before appearing in book-form. "The Moonstone," "Man and Wife," "The New Magdalen," and "The Law and the Lady" are other works of his that had wide circulation. His principal books have been translated into French, Italian, German, Dutch, Danish, and Russian. He died in London, September, 1889.

COLLINSVILLE, a city in Illinois, in Madison co., on the Vandalia railroad. It is the center of an important coal-mining region and has lead smelters and zinc works. There are also manufactures of flour and wool. The city has a hospital and a tuberculosis sanitarium. Pop. (1910) 7,478; (1920) 9,753.

COLLISION, in maritime affairs, the shock of two ships coming into violent contact, whereby one or both may suffer more or less injury. Collision may happen without blame being imputable to either party as in a storm. Or a collision may arise where both parties are to blame—where there has been a want of due diligence or skill on both sides; in which case neither party has an action against the other. Thirdly, it may happen by the misconduct of the suffering party only, and then the rule is that the sufferer must bear his own burden. Lastly, it may have been the fault of the ship which ran the other down; and in that case the injured party would be entitled to an entire compensation from the other.

By the rule of the road at sea, if two sailing ships are approaching each other end on, or nearly so, the helms of both must be put to port, so that each may pass on the port side of the other; in crossing so as to involve risk of collision the sailing ship with the wind on the port side shall keep out of the way of the ship with the wind on the starboard, but if they have both the wind on the same side, the ship which is to windward shall keep out of the way of the one that has it to leeward. If a steamship and a sailing ship are approaching, so as to involve collision the former must keep out of the way of the latter. If one vessel is overtaking another she must keep out of the way of the last-named vessel.

COLLODION, or **COLLODIUM**, a substance prepared by dissolving one part of gun-cotton in a mixture of 36 fluid parts of ether and 12 fluid parts of rectified spirit. The gun-cotton or pyroxylin used for making collodion is prepared by immersing one part of raw cotton fiber in a mixture of five fluid parts of sulphuric acid, and five fluid parts of nitric acid, for three minutes, then carefully washing it with water, and drying it in a water bath; it must be kept in a well-corked bottle. Collodion is used in photography; also in surgery, to form a protecting surface to the skin.

COLLODION-PROCESS, a process in photography invented by Archer, in 1851. An iodized collodion is made by impregnating a solution of gun-cotton in ether, with a small quantity of iodide of potassium or cadmium. A film of the iodized collodion is spread on the glass, which is then immersed in a solution of nitrate of silver. The image is taken in the camera, developed by a weak solution of pyrogallic acid and acetic acid, or a solution of protosulphate of iron. Excess of iodide of silver is removed by hyposulphite of soda or cyanide of potassium. This gives a negative. A positive is obtained by laying the negative on prepared paper and exposing them to light.

COLLOIDS. The first extensive investigation of colloids was made by Thomas Graham in the years 1860-1864. He found that certain substances formed what were, apparently, solutions, in that they would pass, unchanged, through filter-paper, but that they differed from solutions of crystalloids, such as sugar or salt, in that they would not dialyze. See DIALYSIS. These substances he called colloids. Well-known examples are starch, glue, dextrin, albumen, caramel, and tannins. All living matter is, for the most part, built up of colloids. Recent investigations have tended to show that it is possible to bring any substance into a colloidal condition, and colloidal solutions of metals and their compounds have been prepared. The word "colloid" is now used, therefore, to describe a state of matter rather than a particular class of substances.

COLLUSION, in law, a secret agreement between opposing litigants to obtain a particular judicial decision on a preconcerted statement of facts, whether

true or false, to the injury of a third party. Collusion, when proved to exist, nullifies the judgment obtained through it.

COLLYER, ROBERT, an American clergyman; born in Keighley, Yorkshire, England, Dec. 8, 1823. He came to the United States in 1849, being then a Wesleyan preacher and a blacksmith; but became a Unitarian, and preached some years in Chicago, where he founded Unity Church in 1860. He was made pastor of the Church of the Messiah, New York City, in September, 1879, and pastor emeritus in 1896. Included in his publications are: "Nature and Life" (1866); "The Life that Now Is" (1871); "Lectures to Young Men and Women" (1886); "A Man in Earnest"; "Clear Grit" (1914). His "Life and Letters" edited by J. H. Holmes was published in 1917. Died in November, 1912.

COLLYRIDIANS, a sect toward the close of the 4th century, so denominated from the little cakes which they offered to the Virgin Mary. The sect consisted chiefly of Arabian women, who met on a certain day of the year to celebrate a solemn feast and to render divine honors to the Virgin as to a goddess, eating the cakes which they offered in her name. While pagans they had been accustomed to offer similar cakes to Venus or Astarte.

COLMAN, GEORGE, the Elder, an English dramatist; born in Florence, Italy, April 28, 1732. "The Deuce Is in Him," "New Brooms," "The Separate Maintenance," and several other comedies, proclaimed him a man of wit. He died in London, Aug. 14, 1794.

COLOCASIA, a genus of plants, order *Araceæ*. The leaves of the colocasia are peltate, the stem herbaceous, the juice milky, the rootstocks tuberous. India is the home of the genus, though species are now cultivated in most hot countries. The rootstocks of *C. himalensis* form a chief portion of the food of some hill tribes. *C. antiquorum*, called by Linnæus *Arum C.*, the best known species, is cultivated in India, Egypt, etc., for its leaves, which though acrid are boiled till they are wholesome, and eaten as spinach. It has been introduced into greenhouses. The stems and the tubers of *C. indica* are eaten in Brazil. The rootstocks of *C. esculenta macrorhiza*, called "tara" or "kopeh" in the South Sea Islands, are used as food. The leaves of *C. esculenta* have a quivering motion at uncertain intervals every day.

COLOCYNTH, the pith of the bitter apple; the fruit of the *Citrullus Colocynthus*, which is violently purgative. It is imported dried, and generally peeled, from Turkey, and is rarely used alone. One of the most valuable purgatives is the compound extract of Colocynth, which is a combination of this drug with aloes, scammony, cardamom seeds, and soap. In large doses, Colocynth is an irritant poison.

COLOGNE (kō-lōn'), German, *Köln* (keuln), a city of Rhenish Prussia, on the left bank of the Rhine, forming, in connection with Deutz, which serves as a tête-du-pont of the opposite side of the river (across which are several bridges), a fortress of the first rank.

The most important edifice is the cathedral, begun in 1248, one of the finest and largest Gothic structures in Europe. It was only completed in the 19th century, there being expended on it in 1828-1884 over $5,000,000. It is in the form of a cross; its entire length is about 445 feet; breadth, 200 feet; height to ridge of roof, 202 feet; height of the two western towers, between which is a grand portal, 520 feet, being thus among the highest edifices in the world. The council-house, museum, and Gross St. Martin Church with its imposing tower should also be mentioned. The manufactures before the World War embraced sugar, tobacco, glue, carpets, leather, machinery, chemicals, pianos, and the celebrated Eau de Cologne. The trade by river and railway was very great. Cologne was occupied by the British Army of Occupation following the armistice of November, 1918.

Cologne is of pre-Christian origin, and was originally called *Oppidum Ubiorum*, being the chief town of the Ubii, a German tribe. The Romans made it a colony A. D. 51, and called it *Colonia Agrippina* (whence the name Cologne). It was annexed to the German Empire in 870, and became one of the most powerful and wealthy cities of the Hanseatic League, but latterly it declined. In 1792 it ceased to be a free city. It was taken by the French in 1794, ceded to them by the Treaty of Lunéville in 1801, and annexed to Prussia in 1814. Pop. about 520,000.

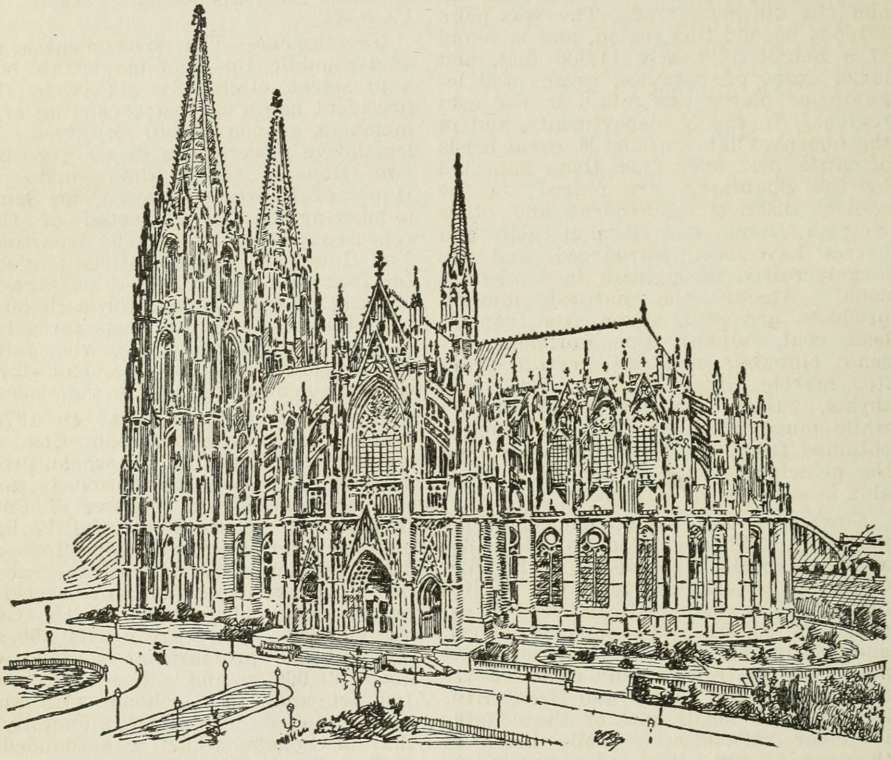
COLOGNE EARTH, a native pigment similar to the Vandyke brown in its uses and properties as a color.

COLOMBIA, a Republic of South America; bounded on the N. by Panama and the Caribbean Sea; E. by Venezuela and Brazil; S. by Brazil and Ecuador; and W. by the Pacific Ocean; area, 513,938 square miles. Pop. about 5,000,000.

Topography. — The surface of the country is extremely varied, with lofty

mountains in the W., and vast plains in the E. scarcely above the level of the sea. The Andes spread out in three great ranges, from the extensive plateau of Pasto in the S. W.; forming valleys running from N. to S. parallel to the three chains. Of the sections outside the main Cordilleras, the principal are the Sierra Nevada de Santa Marta, in the N., and the low Baudo range, along the N. W. coast. From the Central Cordillera the principal rivers, the Magdalena and the Cauca, flow into the Caribbean Sea, besides several affluents of the Amazon in the E., and the Patia, which forces its way to the Pacific, through a gorge between cliffs, 10,000 to 12,000 feet high, and forms the only notable break in the long wall of the Western Cordillera from Darien to Patagonia. The Eastern Cordillera consists of a series of extensive tablelands, cool and healthy, where the white race flourishes as vigorously as in Europe. E. from this Cordillera stretch vast llanos or plains, through which flow the Meta, the Guaviare, and other tributaries of the Orinoco. Besides these, the chief rivers are the San Juan (navigable 150 miles), on the Pacific coast; the Atrato and Zulia (150 miles), flowing N.; the Arauca (600), which, as well as the Meta (700) and Guaviare (850), feeds the Orinoco; and the Caqueta (1,350), the Putumayo (1,100), and the Napo (750), tributaries of the Amazon. The lakes are unimportant.

Climate and Productions. — Colombia possesses all the climates of the world; perpetual snows cover the summits of the Cordilleras, while the valleys abound in the rich vegetation of the tropics. The mean temperature ranges from 32° to 82°, according to the elevation. The rainy season falls from November to April, except among the low-lying forests of the S. E., where the rain-fall is distributed throughout the year, and in the Choco coast district of the N. W., where, shut in from the N. E. winds, the heavy atmosphere hangs motionless, and mists and torrents of rain alternate. The hot region, extending to an elevation of about 3,200 feet, produces in abundance, rice, cacao, sugar-cane, bananas, yams, tobacco, indigo, cotton caoutchouc, vegetable ivory, and many medical plants; and the forests, with



CATHEDRAL AT COLOGNE

their tangua and other stately palms, their rare balsamic resins and valuable dyewoods, are ablaze with flowers and creepers, and steeped in the perfume of the delicate vanilla orchid. In the temperate zone, from 3,200 to 8,500 feet above the sea, many of these plants are equally common, but the cocoanut palm gives place to the oak, the encenillo, groups of laurels, and arborescent ferns, and here flourish the coffee plant, the odorous cherimoya and curibano, the fig, and the cinchona tree. The wax-palm extends beyond this region, and is found at a height of nearly 11,000 feet, and large crops of potatoes, grain, and leguminous plants are raised in the cold regions. In the N. departments, and in the immense llanos of the E. great herds of cattle, descended from those imported by the Spaniards, are reared; in the central districts, shorthorns and other English, Dutch, and Norman cattle and horses have been introduced, and are largely raised throughout the temperate zone. Among the natural mineral products are gold, silver, iron, copper, lead, coal, sulphur, zinc, antimony, arsenic, cinnabar, rock-salt, crystal, granite, marble, lime, gypsum, jet, amethysts, rubies, porphyry, and jasper; while much of the world's platinum is obtained from the upper San Juan, and the principal source of the finest emeralds is at Muzo in Boyaca.

Commerce and Production.—The imports in 1918 amounted to £4,406,800 and the exports to £7,545,712. The chief trade is carried on with the United States. The principal articles of export are coffee, bananas, gold, silver, and platinum. The chief imports are flour, lard, petroleum, and cotton works from the United States and Great Britain. Only a small part of the country is under cultivation. While much of the area is fertile, its development is prevented by lack of communication and transport. The chief product is coffee. Tobacco is also grown and cotton is produced in several provinces.

Finance.—The estimated revenue for 1920-1921 was 22,000,000 gold pesos, and the estimated expenditure the same amount. The revenue in 1919-1920 was 15,307,350 pesos, and the expenditure 15,307,345 pesos. The external debt in 1919 was £3,766,746. The internal debt in 1919 was 4,500,432 gold pesos.

Railways.—There are 15 lines of railways, of which 10 are national and 5 are owned by British companies. The total length of track is 740 miles. The government has undertaken the improvement of the main roads, but in general the roads are scarcely more than mule tracks. Much of the inland traffic is by river, and the lower and upper Magdalene are being improved and cleared. From 1891 numerous attempts have been made to construct a ship canal across the Isthmus of Panama following the line of the railroad. The French company failed, and in 1903 sold out their franchise and property to the United States Government, and in the same year Panama seceded from Colombia and became an independent state. See PANAMA.

Government.—The government is that of a republic, the chief magistrate being a president, elected for six years. The president has a cabinet consisting of six members, responsible to Congress. The legislative power vests in a Congress of two Houses, called the Senate and House of Representatives. The Senate, numbering 34, is composed of three representatives from each department. The House of Representatives is elected for four years by universal suffrage and consists of one member for each 50,000 inhabitants. Congress elects for a term of two years a substitute, who, failing the president and vice-president during the presidential term, fills the vacancy.

Education, Religion, etc.—In 1870 a system of compulsory education was adopted which has, on the whole, proved successful. Public instruction is under the direction of the Minister of Public Instruction. There were in 1917 5,488 primary schools, with 430,707 pupils, and 5,733 teachers. Nearly all the schools for secondary education are carried on by religious corporations of the Catholic Church. There are nearly 400 secondary and professional schools with about 35,000 pupils. There are about 100 art and trade schools with about 8,000 pupils. The chief university is that of Bogotá, which was founded in 1572. There are also universities at Medellin, Cartegena, Popayan, and Pasto. There were in 1918 29 normal schools. The annual expenditure for education is about 1,000,000 pesos.

The State Church is the Roman Catholic, which in the management of its own affairs is independent of civil authority; religious orders were suppressed in 1863, and toleration in matters of religion is guaranteed; but, by the terms of a concordat entered into with the Holy See in 1888, religion is one of the obligatory subjects of study in all educational establishments.

History.—The N. coasts of Colombia were visited by Ojeda and Amerigo Vespucci, in 1499, and afterward by Bastidas; in 1502 Columbus explored part of the country, and endeavored to found

on the Isthmus of Panama the first Spanish colony on the American mainland. In 1513 Balboa discovered the Pacific, and Pizarro and Almagro sailed along the W. coast of Colombia on their way to Peru in 1526. Ten years later Jiminez de Quesada broke the power of the Muyscan empire, and the Nuevo Reino de Granada was formed. As the country was opened up, the Indians sank to the condition of serfs, and the policy of the crown, aided by the Inquisition, which was introduced in 1571, put an end to the democratic institutions of the early settlers. The country formed a presidency (except during the years 1718-1724) from 1564 to 1739, a period memorable for the disastrous descents of Drake, Morgan, Dampier, and others on the coast towns; it was then raised to a viceroyalty, which lasted until the war of independence. A revolution broke out July 20, 1810, which ended in the election of Bolivar to the presidency of the Republic of Colombia, a term which, like the viceroyalty, embraced all that now belongs to Venezuela, Colombia, and Ecuador. So long as union was necessary to meet external dangers, it maintained an imposing attitude in the eyes of the world; but gradually sectional interests and political jealousies did their work, and in 1831 the ill-assorted elements of the confederation were separated. What is now Colombia was then formed under the title of the Republic of New Granada, but in 1861 a fresh civil war led to the establishment of the United States of Colombia. In 1863 a constitution was adopted, based on that of the United States of America, with a president elected for two years; but this proved altogether unsuited to the Colombians, and, after twenty years' trial, brought about the revolution of 1884-1885. In 1886 a fresh constitution was adopted for the new Republic of Colombia, placing the central authority in the hands of the Federal Government.

The chief international political interest of Colombia in recent years has centered about the formation and recognition of the Republic of Panama and the construction of the Panama Canal. The recognition of the new Republic of Panama, which included a former province of Colombia, created much resentment in the latter country. In 1909 a treaty was negotiated between Panama and the United States in which the two powers were exonerated by Colombia from the charge of injustice. The popular feeling against the treaty was so great that President Reyes, who supported it, was forced to resign. In the following year there were serious riots in Bogotá against the United States minister and American citizens. This was followed by an apology by the Colombian Government. Shortly after the inauguration of President Wilson a treaty was negotiated with Colombia in which the United States, in effect, apologized for the methods employed to secure the Panama Canal Zone, and offered to pay Colombia $25,000,000 damages. This treaty, however, failed to pass the Senate. Difficulties with Peru over the southern boundary of Colombia arose in 1911 and Peruvian troops occupied a strip of territory along this boundary. They were attacked by Colombian forces and the latter were defeated.

During the World War Colombia remained neutral, but in October, 1917, Congress passed a resolution protesting against the submarine warfare of Germany.

COLOMBO, a seaport town, the capital of Ceylon, on the S. W. coast, and about 70 miles W. by S. of Kandy, with which it is connected by railway. It is a pleasant town with an extensive fort, within which are some of the best houses. On the margin of the sea is the Pettah or Black Town, inhabited chiefly by Singhalese, while in the environs are most of the houses occupied by the English. Through the construction of a breakwater and other works there is excellent harbor accommodation; and numerous vessels call here. Pop. about 215,000.

COLON, the greatest and widest of all the intestines, about 8 or 9 hands' breadth long. It begins where the ilium ends, in the cavity of the os ilium on the right side; from thence ascending by the kidney on the same side, it passes under the concave side of the liver, to which it is sometimes tied, as likewise to the gall-bladder, which tinges it yellow in that place; then it runs under the bottom of the stomach to the spleen in the left side, to which it is also knit; from thence it turns down to the left kidney; and thence passing, in form of an S, it terminates at the upper part of the os sacrum in the rectum.

The Colon-bacillus is the microbe of Asiatic cholera.

COLON, or **ASPINWALL** (the former the official name), a free port of Panama, on Manzanillo Island, on the N. side of the Isthmus of Panama, at the Atlantic extremity of the interoceanic railway, and near that of the Panama canal. It had an important transit trade before the canal was begun, and since then the place has been entirely transformed, a new town with wide and regular streets having been built on a tract of land re-

claimed by the canal company. There is extensive harbor accommodation. The completion of the Panama canal made Colon an important commercial port. The United States Government has introduced modern systems of sanitation and sewers, which have made the city, formerly very unhealthful, one of the healthiest places in the tropics. Pop. about 20,000. See PANAMA.

COLONEL, the commander of a regiment, whether of cavalry, infantry, or artillery. Any rank above a Colonel constitutes the bearer of it a general officer. In the British service the rank of Colonel is honorary, except in the artillery and engineers, and is usually bestowed upon officers of superior rank and princes of the blood. In the United States army a Colonel is commander of troops below a Brigadier-General, and above a Lieutenant-Colonel.

COLONIA, a department of Uruguay, on the Plata, below the Uruguay river. The uplands are barren, but in the fertile valleys and plains are numerous European colonies, engaged in agriculture and stock-raising. Area, 2,192 square miles; pop. (1917) 82,596. The capital, Colonia del Sacramento, on the Plata, about 100 miles above Montevideo, has a good harbor.

COLONIAL ANIMALS, organisms which cannot be fairly regarded as unities, but consist of numerous more or less similar individuals united in a common life. Among the usually single-celled simplest animals or protozoa, loose colonies not infrequently occur, and are of not a little importance as suggestions of the bridge between the single-celled and many-celled animals. Such colonies arise when the original cell, instead of reproducing discontinuously, retains its daughter-cells in union with itself or with one another, just like the egg-cell of a higher animal. By sacrifice of individuality at the epoch of reproduction, a higher unity is formed. In the same way a simple cup-shaped sponge, by continuous budding, forms a colony of similar forms, which may possess more or less distinct individuality. The common fresh-water *Hydra*, to mount a step higher, buds off daughter *Hydræ*, which remain for a while connected with the parent organism and make it temporarily colonial.

COLONIAL DAMES OF AMERICA, NATIONAL SOCIETY OF THE, a women's patriotic organization, founded at Wilmington, Del., in 1892. Each of the original 13 colonies has a State society, as has also the District of Columbia. In many of the non-colonial States there are associated chapters. To become a member one must be especially invited, and must have one worthy ancestor who was in the colonies by the year 1750. The object of the society is to preserve historical monuments and relics, erect memorials, and publish information regarding American history. One of their important publications is "The Letters of William Pitt, Lord Chatham."

COLONIAL DAMES OF AMERICA, SOCIETY OF, women's patriotic society founded at New York City in 1890, with the object of fostering a spirit of patriotism, caring for the historical relics of colonial and Revolutionary times, and of celebrating the success of the American Revolution. To become a member one must have had an ancestor of distinction who resided in the colonies prior to the year in which the Declaration of Independence was issued. There are chapters of the society in New York, Philadelphia, Baltimore, Paris, San Francisco, and Shreveport, La.

COLONIAL WARS, SOCIETY OF, a patriotic organization founded in New York City in 1892. There are many State societies with a general society made up of officers and delegates. Their object is to keep alive the memory of men and events of the colonial and Revolutionary times. They admit to membership men who are descended from those who fought for or served in the establishment and preservation of the American colonies as a nation. In addition to the collecting of many papers valuable for throwing light upon colonial times they have erected valuable memorials to American heroes: one at Louisburg on Cape Breton Island, one at Fort Oswego and Fort Ticonderoga, and a very striking monument at Lake George.

COLONNA, a village in the former Papal states, which gave its name to one of the most powerful and celebrated aristocratic Roman families. The Colonna produced in the Middle Ages many distinguished members, among whom, besides Pope Martin V., were:

COLONNA, PROSPERO, son of Antonio Colonna, prince of Salerno. He assisted Charles VIII. of France to conquer Naples, but subsequently aided in retaking it for the House of Aragon. He served under the great Gonsalvo, and was charged by him to conduct Cesare Borgia prisoner to Spain. In 1513 Prospero defeated the Venetians near Vicenza, was captured by the French two years later, but won several victories over them in 1521 and the following years. He died in 1523.

COLONNA, POMPEO, nephew of the above, a restless and intriguing Roman cardinal. He quarreled in succession with the Popes Julius II., Leo X., and Clement VII., and had part in all the troubles of the court of Rome. When Clement VII. was the prisoner of the Constable de Bourbon, Pompeo exerted his influence for his liberation. He at length became viceroy of Naples. He died in 1532.

COLONNA, VITTORIA, an Italian poetess, daughter of Fabrizio Colonna, high constable of Naples, born in 1490. When 4 years old, she was betrothed to a boy of the same age, Fernando d'Avalos, son of the Marchese di Pescara. At 17 they were married. After her husband's death in the battle of Pavia (1525), Vittoria found her chief consolation in solitude, and the cultivation of her poetical genius. During seven years of her widowhood, she resided alternately at Naples and Ischia, and then removed to the convent of Orvieto, and afterward to that of Viterbo. In her later years she left the convent, and resided in Rome, where she died in February, 1547. Her poems were chiefly devoted to the memory of her husband. The Colonna palace, at the base of the Quirinal, in Rome, is celebrated for its splendid picture-gallery and magnificent gardens.

COLONNA, CAPE (ancient *Sunium Promontorium*), a headland of Greece, forming the southernmost point of Attica, and crowned by the ruins of a temple of Minerva, 13 of whose white marble columns, from which the cape derives its modern name, are still standing.

COLONNADE, a range of columns. If the columns are four in number it is *tetrastyle;* if six in number, *hexastyle;* when there are eight, *octastyle;* when ten *decastyle*, and so on, according to the Greek numerals. When a colonnade is in front of a building it is called a *portico;* when surrounding a building a *peristyle:* and when double or more, *polystyle.* The colonnade is, moreover, designated according to the nature of the intercolumniations introduced as follows: *pycnostyle*, when the space between the columns is one diameter and a half of the column; *systyle*, when it is of two diameters; *eustyle*, when of two diameters and a quarter; *diastyle*, when three; and *aræstyle*, when four. A colonnade differs from an arcade in this respect, that the columns of the former support straight architraves instead of arches.

COLONUS, in civil law, a freeman of inferior rank, corresponding with the Saxon *ceorl* and the German rural slaves. It has been held probable that many of the ceorls were descended from the *coloni* taken into Saxony by the Romans. The names of the *coloni* and their families were all recorded in the archives of the colony or district, from which fact they were also known as *adscriptitii.*

COLONY, a settlement formed in one country by the inhabitants of another. Colonies may either be formed in dependence on the mother country or in independence. Among ancient nations the principal promoters of colonization were the Phœnicians, the Greeks, and the Romans; the greatest colonizers in modern times have been the English and the Spaniards.

Ancient Colonies.—The Phœnician colonies were chiefly commercial, serving as entrepôts and ports of repair for Phœnician commerce along the coasts of Africa and Spain, in the latter of which they numbered, according to Strabo, more than 200. Carthage, which was itself a colony of Phœnicia, was the greatest colonizing state of the ancient world. The Greek colonies, which were widely spread in Asia Minor and the islands of the Mediterranean, the coasts of Macedonia and Thrace, in south Italy and Sicily, were commonly independent, and frequently soon surpassed the mother states in power and importance. The colonies of Rome were chiefly military, and while the empire lasted were all in strict subordination to the central government. As the Roman power declined the remains of them amalgamated with the peoples among whom they were placed, thus forming in countries where they were sufficiently strong what are known as the Latin races, with languages (Spanish, Portuguese, French, and Italian) which are merely modifications of the old Roman tongue.

Portuguese.—These were the first great colonizers among modern states. In 1419 they discovered Madeira, the Azores, and the Cape Verde Islands; the Kongo and the Cape of Good Hope followed; and before the century was out Vasco da Gama had landed at Calicut on the Malabar coast of India. The first Portuguese colonies were garrisons along the coasts where they traded; Mozambique and Sofala on the E. coast of Africa; Ormuz and Muscat in the Persian Gulf, Goa, and Damao on the W. coast of India. Colonies were established in Ceylon in 1505; in the Moluccas in 1510. Brazil was discovered in 1499, and this magnificent possession fell to Portugal, and was colonized about 1530. The Portuguese now possess several territories in Asia, at Goa, Damao and Diu, India; Macao, China; and some islands in the Indian Archipelago. In Africa they possess the

Cape Verde and other islands; settlements in Senegambia, Guinea, Mozambique, Sofala, Angola, Benguela, Mossamedes, amounting in area to about 700,000 square miles; but Portuguese influence is really limited to a very small portion of this.

Spanish.—Soon after the Portuguese the Spaniards began the work of colonization. In 1492 Columbus, on board of a Spanish vessel, discovered the island of San Salvador. Haiti, or San Domingo, Porto Rico, Jamaica and Cuba were soon colonized, and before the middle of the 16th century Mexico, Ecuador, Venezuela, New Granada, Peru, and Chile were subdued, and Spain took the first rank among the colonizing powers of Europe. In 1899 Spain sold to Germany the Caroline Islands; all of the Ladrones excepting Guam, which had been ceded to the United States in 1898; and the Pelew or Palaos group; and only retained her African possessions.

Dutch.—Philip II. barred Dutch vessels from the port of Lisbon, and this forced the Dutch to import directly from India. Several companies were soon formed, and in 1602 they were united into one, the Dutch East India Company, with a monopoly of the East India trade and sovereign powers over all conquests and colonies in India. The Dutch now rapidly deprived the Portuguese of nearly all their East Indian territories, settled a colony at the Cape of Good Hope (1650), established a West India Company, made extensive conquests in Brazil (1623-1660), which were soon lost, and more permanent ones on some of the smaller West India Islands, as San Eustatia, Curaçao, Saba, etc. The Dutch still possess numerous colonies in the East Indies, the most important of which are Java, Sumatra, Dutch Borneo, the Molucca Islands and part of New Guinea; also several small islands in the West Indies, and Surinam.

English.—No colonizing power of Europe has had a career of such uniform prosperity as Great Britain. After many fruitless attempts to find a N. E. or N. W. passage to the East Indies, English vessels found their way round the Cape of Good Hope to the East Indies in 1591, and the East India Company was established in 1600. On the suppression of the Indian mutiny (1857-1858) the government of India was transferred to the crown by act of parliament in 1858. The English claim to North America, though allowed to lie dormant for nearly a century, was not relinquished and in the reign of Elizabeth, led to colonization on a large scale. Australia was discovered in the beginning of the 17th century, and the first Australian settlements were British penal colonies. In 1851 the discovery of the abundance of gold in Victoria gave a great impetus to the prosperity of the Australian colonies. In 1874 the Fiji Islands, and in 1884 part of New Guinea, were annexed as crown colonies. In south Africa, Cape Colony, first settled by the Dutch in 1652, became an English colony in 1814. The latest annexations in this quarter are Griqualand West (1880), the Transkeian Territories (1875-1884), Walfisch Bay (1884), Bechuanaland (1885), the former Orange Free State and Transvaal Republics (1900). The Protectorate of Southwest Africa, taken from Germany in 1915, and administrated under a mandate by the Union of South Africa. Further N. are the crown colonies, Lagos, the Niger Districts, the Gold Coast, Gambia, and Sierra Leone, all, except Lagos, which was acquired in 1851, ancient possessions of the British Crown. Togoland and a part of Cameroon, both conquests from the Germans. In Europe, Great Britain has a few colonies acquired for military reasons, Gibraltar in 1704, Malta and Gozzo, 1800.

French.—Among the most important are Pondicherry, and a few other small territories in India; Cochin-China, Tonquin, and the protectorates of Annam and Cambodia in southeastern Asia; New Caledonia, the Loyalty and Marquesas Islands, etc., in Oceania; in Africa, Algeria, Tunis, Senegambia, Islands of Reunion, the protectorate of Madagascar, etc.; in America, Martinique, Guadeloupe, St. Bartholomew, and Guiana. Algeria is now officially a French department. One senator and one deputy are allowed to represent French Indo-China in the Chambers of Paris. Cochin-China, populated by Annamites, Cambodians, Chinese, Malays and Malabarians, is entitled, however, to but one representative, a deputy. Tonquin, the adjacent French colony, is not represented, the government being administered by resident French officials. The African colonists are administered by the Minister of the Colonies through governors or commissioners-general. Algeria, however, on the N. coast, is given a distinct government and laws, and is looked upon as a part of the Republic, the Chambers alone having the right to legislate for it. Crossing to the West Indies, France allows Martinique and Guadeloupe each one senator and two deputies. French Guiana, however, has only one representative, a deputy.

Germans and Danes.—Germany made a strong effort to take rank as a colonial

power, and acquired in Africa the territories of Damaraland and Lüderitzland to the N. of Cape Colony, the Kamerun District, a considerable portion of territory formerly claimed by the Sultan of Zanzibar, the Kilima-Njaro, the greater part of Somaliland, etc.; also in the Pacific a portion of New Guinea, now called Kaiser Wilhelm's Land; the Bismarck Archipelago; and the Caroline, Pelew, and Ladrone (excepting Guam) Islands. These colonies were all lost by the provisions of the Treaty of Versailles. By the terms of the treaty Great Britain was given a mandate for the former German African colonies, Australia administers the Bismarck Archipelago and Kaiser Wilhelm's Land. Denmark's dependencies, Iceland, Greenland, and the Faroe Islands, though of considerable extent, are of small value.

The United States has acquired Porto Rico, the Philippine and Sulu Islands, the Ladrone Island of Guam; and the Virgin Islands (Danish West Indies) by treaty and purchase ($25,000,000) in 1916.

COLOPHONY, the dark resin obtained by distilling turpentine.

COLOR, the visual impression derived from the hue of any object. The color of any source of light, or of any object which we see, is solely dependent upon the wave-lengths of the vibrations of the light which come to our eyes from the object. In the case of self-luminous objects these wave-lengths are principally dependent on the temperature of the object and the character of the surrounding absorbing atmosphere, if it has any such; or, in the case of gaseous masses, likewise upon their electrical condition and the pressure to which the gas is subjected. In the case of the non-luminous bodies the wave-lengths are dependent upon the reflecting nature of their surfaces, and are also modified by surrounding atmospheres if they have such.

COLORADO, a State in the Western Division of the North American Union; bounded by Wyoming, Nebraska, Kansas, Oklahoma, New Mexico, and Utah; gross area, 103,645 square miles; admitted to the Union, July 4, 1876; number of counties, sixty-three; population (1890) 412,198; (1900) 539,700; (1910) 799,024; (1920) 939,629; capital, Denver.

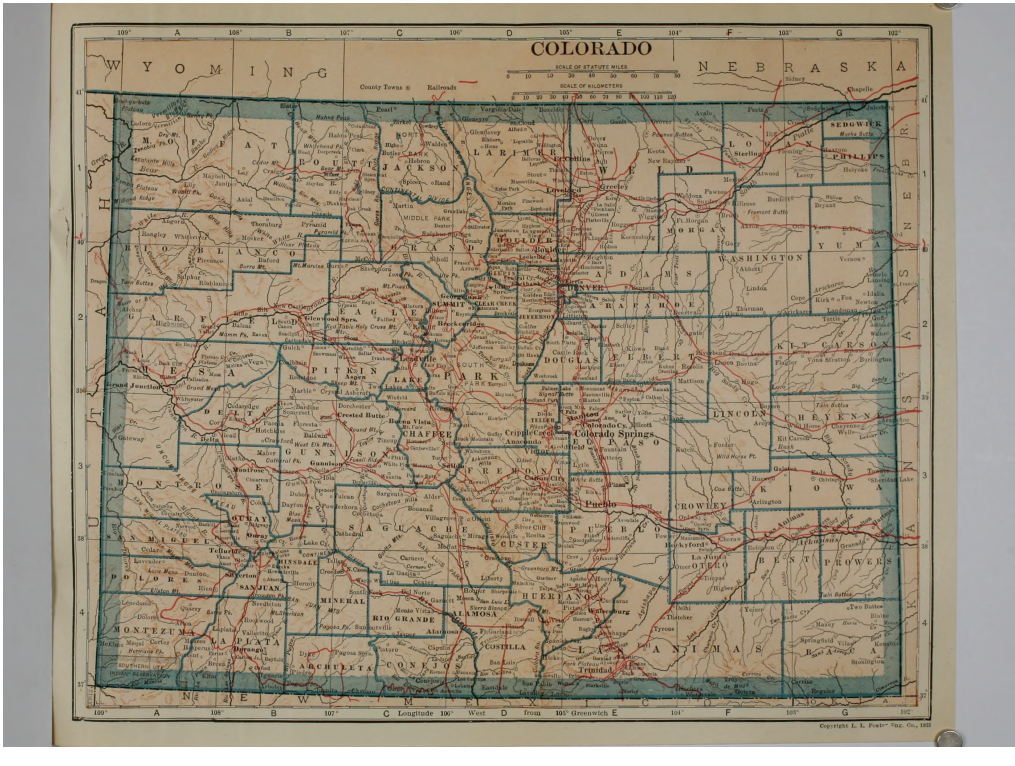
Topography.—Colorado is very mountainous, being traversed by the Rocky Mountains, which extend over nearly the entire W. part of the State. The average altitude of the State is 7,000 feet, the lowest portion being 3,000 feet above the sea, and there are over 100 mountain peaks more than 13,000 feet high. The Sawatch or Saguache range, or Great Divide, is a continuation of the Sierra Madre range of Mexico, and contains the peaks, Mt. Harvard, 14,375; Mt. Elbert, 14,351; and the Mountain of the Holy Cross, 14,175 feet. The Park Range joins this range in the N., highest points Torrey's Peak, 14,147 feet, and Gray's Peak, 14,341 feet. The Front Range contains Pike's Peak, 14,147 feet, and Evans, 14,330 feet, and is situated a little E. of the main ranges. In the S. is the Sangre de Cristo range, containing Blanca Peak, the highest in the State, 14,464 feet. In the W. part are several lower ranges, running in a general N. W. and S. E. direction. The valleys are a distinguishing feature of the scenery, and are known as parks. San Luis is the largest and has an area of 8,000 square miles, quite level, and at an elevation of 7,000 feet. The only lake of any size in Colorado is in this park, is about 6 miles in length, and is fed by nearly 20 streams. Colorado is the principal watershed in the Western States, many of the largest rivers having their origin here, among them the Platte, Colorado, San Miguel, Arkansas, and Rio Grande del Norte. Nearly all these rivers wind their way through rocky cañons, varying from one to 3,000 feet in depth. "Monument Park" and the "Garden of the Gods" have rock spires, rising above the meadow land, shaped like towers and pillars, caused by erosion.

Geology.—The mountains of Colorado are mostly of azoic and eozoic formation, while the E. and S. W. slopes are of palæozoic, bordered by metalliferous, jurassic, and triassic strata in the W. central parts. The extreme E. plain is largely tertiary, and the S. W. is chiefly cretaceous, the valleys of the South Platte and Arkansas rivers being of this formation.

Soil, Climate, etc.—Colorado has about 15,000 square miles of fertile arable land, and about 70,000 square miles of grazing land. Most of the land will produce abundant crops under irrigation, which is now being carried on extensively, one irrigating canal having a length of 54 miles. The mountains are well covered with pine, spruce, and fir forests. The climate is very healthful and mild, and people suffering from pulmonary and asthmatic troubles find much relief here. There are various mineral springs, which are valuable for medicinal purposes. The hot sulphur springs in Middle Park and Wagon Wheel gap, and the hot, iron, and soda springs in Manitou are popular resorts.

Mineral Production.—Colorado for many years was first among the States in the value of its mineral products. For


41
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40
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39
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38
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37


COLORADO
WYOMING
NEBRASKA
KANSAS
NEW MEXICO
SCALE OF STATUTE MILES
SCALE OF KILOMETERS
County Towns
Railroads
Longitude 106° West from 105° Greenwich
Colorado Springs
Pueblo
Denver
Boulder
Fort Collins
Greeley
Longmont
Loveland
Aspen
Leadville
Glenwood Springs
Grand Junction
Durango
Cripple Creek
Trinidad
Sterling
Julesburg
Holyoke
Wray
Yuma
Burlington
Lamar
Las Animas
Springfield
Two Buttes
Boundary
Larimer
Weld
Logan
Phillips
Sedgwick
Washington
Adams
Arapahoe
Kit Carson
Douglas
Elbert
Lincoln
Cheyenne
Kiowa
Crowley
Otero
Bent
Prowers
Jackson
Routt
Moffat
Rio Blanco
Garfield
Eagle
Pitkin
Lake
Park
Chaffee
Gunnison
Hinsdale
Ouray
San Juan
Dolores
Montezuma
La Plata
Archuleta
Rio Grande
Alamosa
Conejos
Costilla
Mineral
Saguache
Custer
Huerfano
Las Animas
Montrose
Delta
Mesa
Grand
Summit
Clear Creek
Gilpin
Jefferson
Teller
Morgan
Weld
Baca
Prowers
Bent
Otero
Crowley
Kiowa
Cheyenne
Kit Carson
Yuma
Phillips
Sedgwick
Logan
Washington
Lincoln
Elbert
Arapahoe
Adams
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Eagle
Garfield
Rio Blanco
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Sedgwick
Phillips
Yuma
Kit Carson
Cheyenne
Kiowa
Crowley
Otero
Bent
Prowers
Baca
Las Animas
Huerfano
Custer
Fremont
Chaffee
Lake
Pitkin
Gunnison
Hinsdale
Saguache
Rio Grande
Alamosa
Conejos
Costilla
Archuleta
La Plata
Montezuma
Dolores
San Juan
Ouray
Gray
Montrose
Delta
Mesa
Grand
Platte
Republic
Sterling
Julesburg
Holyoke
Wray
Yuma
Burlington
Lamar
Las Animas
Springfield
Two Buttes
Boundary
Trinidad
Walsenburg
La Junta
Rocky Ford
Lamar
Granada
Holly
Eads
Ordway
Pueblo
Canon City
Florence
Cripple Creek
Colorado Springs
Monument
Palmer Lake
Castle Rock
Parker
Aurora
Denver
Boulder
Longmont
Fort Collins
Greeley
Loveland
Estes Park
Central City
Idaho Springs
Georgetown
Breckenridge
Leadville
Aspen
Glenwood Springs
Grand Junction
Gunnison
Montrose
Ouray
Silverton
Durango
Cortez
Dolores
Telluride
Lake City
Creede
Del Norte
Monte Vista
Alamosa
La Jara
Conejos
Antonito
Chama
Pagosa Springs
Ignacio
Bayfield
Hesperus
Mancos
Dolores
Rico
Norwood
Nucla
Naturita
Paonia
Hotchkiss
Delta
Montrose
Ouray
Silverton
Durango
Cortez
Dolores
Telluride
Lake City
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Rico
Norwood
Nucla
Naturita
Paonia
Hotchkiss
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various reasons, including the development of mineral fields in other Western States, the working out of hitherto important mines, and the decline in the price of silver, have resulted in a relative change of this position. The mineral industry, however, is still the most important in the State, and Colorado continues to rank high among the mineral-producing States. The total value of the mineral products in 1917, the latest date for which complete figures are available, was $80,586,021. Coal was the most valuable of the mineral products, with 12,483,336 tons, valued at $27,669,129. Gold was second in value with 760,901 fine ounces, valued at $15,729,224. Zinc was third with 60,158 tons, valued at $12,272,209. The silver production was 7,304,353 fine ounces, valued at $6,018,787. Other important mineral products were coke, clay products, tungsten ore, and ferro alloys. The production of the principal minerals mined in the State in 1919 was as follows: Gold, $9,892,000; silver, 5,630,000 ounces; lead, 35,650,000 pounds; copper, 3,400,000 pounds; zinc, 52,300,000 pounds. The total value of these products was $22,522,000. The estimated coal production in 1919 was 10,100,000 short tons, a decrease of over 2,000,000 tons from the production of 1918.

Agriculture.—The acreage, production, and value of the principal crops in 1919 were as follows: Corn, 671,000 acres, with a production of 11,206,000 bushels, valued at $15,913,000; oats, 249,000 acres, with a production of 6,524,000 bushels, valued at $5,872,000; wheat, 1,459,000 acres, with a production of 17,645,000 bushels, valued at $35,643,000; hay, 1,065,000 acres, with a production of 2,396,000 tons, valued at $44,326,000; beans, 69,000 acres, with a production of 448,000 bushels, valued at $1,568,000; potatoes, 92,000 acres, with a production of 11,004,000 bushels, valued at $18,768,000.

Manufactures.—There were in 1914 2,126 manufacturing establishments in the State, employing 27,228 wage earners. The capital invested was $181,776,000; the amount paid in wages, $20,200,000; the value of the materials used, $89,776,000; and the value of the finished products, $136,839,000.

Banking.—In 1919 there were 128 National banks in operation, having $5,491,000 capital, $7,981,596 in outstanding circulation, and $7,885,250 in United States bonds. There were also 228 State and savings banks, with $5,063,000 in capital, $44,709,000 in deposits, and $55,231,000 in resources. In the year ending Sept. 30, 1919, the exchanges at the United States clearing-house at Denver aggregated $1,520,001,000.

Education.—There were in 1918 176,523 pupils enrolled in the elementary schools. Of this 91,229 were boys and 85,294 were girls. In the secondary schools were enrolled 24,240 pupils. The total enrollment in all grades was 200,763. The average daily attendance was 137,984. There were employed in the elementary schools, 6,167 teachers, of whom 5,944 were women and 223 men. In the secondary schools were 1,052 teachers, of whom 714 were women and 338 were men. There were in all 6,926 teachers in the elementary and secondary schools of the State. The average annual salary of teachers in all schools was $749. The permanent school fund of the State amounted to $4,948,492. The total expenditures for the support of schools were $7,093,598.

Churches.—The strongest denominations numerically in the State are the Roman Catholic, Methodist Episcopal, Presbyterian, Baptist, Protestant Episcopal, Congregational, Lutheran, and Disciples of Christ.

Railways.—The railway mileage of the State in 1919 was 5,542. The Denver and Rio Grande has a mileage of approximately 2,600 miles of track.

State Government.—The governor is elected for a term of two years, and receives a salary of $5,000 per annum. Legislative sessions are held biennially. The Legislature has 35 members in the Senate (elected for four years and 65 in the House (elected for two years). There are four Representatives in Congress.

History.—The name Colorado comes from that of the river, meaning "red water." Explorations were made here by United States army officers in 1806, 1819, and 1842-1844, and several fur-trading stations were established. In 1854 Conejos, in the Rio Grande Valley, was founded by colonists from New Mexico, and a Jesuit mission established. Gold was discovered in 1858, and as a consequence of this, Denver, Boulder, and Auraria were speedily founded and made a county of the Territory of Kansas. In 1861 Colorado, according to its present limits, was organized as a Territory, and in 1876 was admitted into the Union, receiving the popular designation of the "Centennial State."

COLORADO BEETLE, a beetle first described by Thomas Say, in 1824, from specimens found by him near the Upper Missouri. He called it *Doryphora decemlineata*. The genus *doryphora* had been previously founded by Illiger. The

genus is American, and is placed under the *chrysomelidæ*. The larva of the species distinguished as *decemlineata* feeds greedily on the potato, and having attracted notice in Colorado for its ravages among the crops of that esculent in the Territory, it moved eastward year by year, till in 1874 it had reached the Atlantic seaboard.

COLORADO COLLEGE, a coeducational (non-sect.) institution in Colorado Springs, Col.; organized in 1874; reported at the end of 1919: Professors and instructors, 43; students, 592; president, Clyde A. Duniway, LL.D.

COLORADO RIVER, or COLORADO OF THE WEST, a great river of the United States and Mexico, formed at about 38° N. lat. and 110° W. lon., by the junction of the Green and Grand rivers. The Green river rises in the Rocky Mountains in the W. of Wyoming, receiving in its S. W. course the waters of the Bear, the White, the Uintah, and San Rafael. From Flaming Gorge, a point in the N. W. of Colorado, where the Uintah Mountains rise, the Green river cleaves its way rapidly through cañons, the walls of which tower up to a height of nearly 1,500 feet. The Grand river rises in the Rocky Mountains, W. of Denver, Col., receiving in its S. W. course the South Fork or Gunnison, the San Miguel, and Dolores. After the junction the Colorado flows S. W. through Utah, joined on the E. by the San Juan, on the W. by the Dirty Devil and Escalante; S. W. through the N. of Arizona, till its waters are increased by the Colorado Chiquito, or Little Colorado of Arizona.

From the mouth of the Little Colorado the river bends W., and for the first 200 miles shoots through the wonderful "Grand Cañon." The walls of this water-worn trench are often vertical, or nearly so, for a distance of thousands of feet at a time; sometimes they slope steeply, or constitute magnificent terraces. Escaping from the Grand Cañon, the river flows S. W. to the borders of Nevada, receiving from the W. the Paria, Tapeat's river, the Kanat (of Arizona), and the Virgin (of Nevada).

Above Callville, Nev., the Colorado, as also its tributaries, again bores its way through deep cañons, the sides of which in some places present walls of solid rock nearly 7,000 feet high. Below Callville the river is again shut in by the last of the cañons, the Black Cañon, 25 miles long, and from 1,000 to 1,500 feet high. Shortly after receiving the Virgin, the Colorado takes a S. course, severing Arizona and Sonora on the E. from Nevada, California, and Lower California on the W., and receiving on the E. Bill Williams' Fork and the Gila. After absorbing the Gila the river sweeps round in a W. direction for 7 or 8 miles, and soon expands to a width of 1,200 feet. Thence it pursues a tortuous course of 180 miles, the last portion being through Mexican territory to its mouth in the Gulf of California. From the sources of the Green river the Colorado measures a total length of about 2,000 miles. It is navigable for steamers as far as Callville, 612 miles from its mouth, and can be made navigable, it is thought, to the foot of the Grand Cañon, 57 miles higher.

COLORADO RIVER, one of the chief streams of Texas. Rising in the high tablelands of Bexar, near the line of New Mexico, about lat. 32° 30′ N., and lon. 102° W., it flows S. E., receiving in its upper course the Conca, the San Saba, and the Lano on the S., and the Pecan from the N., and empties into Matagorda Bay. Austin, Bastrop, and Columbus are on its banks, and Matagorda near its mouth. For most of its course it flows through a fertile region and has an average width of 250 feet. It is a clear stream; its name, meaning red, was originally applied to the Brazos N. and E., but the two were interchanged. The Colorado is some 900 miles long, and navigable to Austin or farther.

COLORADO SPRINGS, a city and county-seat of El Paso co., Colo.; on the Denver and Rio Grande, the Atchison, Topeka and Santa Fe, Chicago, Rock Island and Pacific and other railroads; 70 miles S. of Denver. It is situated on a plain 6,000 feet above sea-level, and is a health resort for victims of lung troubles. The city is the center of the gold mining district of Colorado, and the seat of Colorado College, sanitariums, St. Francis Hospital, the State School for Deaf Mutes, and the Union Printers' Home, several parks, and many handsome public buildings. It has electric railway connection with adjacent towns, electric lights, public schools, several daily and weekly newspapers, churches, and National banks. Pop. (1910) 29,078; (1920) 30,105.

COLORADO STATE AGRICULTURAL COLLEGE, a State institution for agricultural and scientific education, founded at Fort Collins, Colo., in 1876. It is coeducational. It gives degrees in engineering, agriculture, and home economics. The library contains about 50,000 volumes.

COLORADO, UNIVERSITY OF, a coeducational (non-sect.) institution in

Boulder, Col.; founded in 1877; reported at the end of 1919: Professors and instructors, 200; students, 1868; volumes in the library, 118,500; income, $600,000; president, George Norlin, Ph. D.

COLOR BLINDNESS, a peculiar defect of sight in which those who are affected are incapable of distinguishing different colors. Some see everything either to be light or dark, and have no conception of any other colors. This condition is, however, happily rare.

COLOR HEARING, a vision of colors, which in some persons is thought to accompany their peception of sounds. Known also as Color Audition.

COLOR LINE, a line of social distinction drawn between the white people and negroes in the United States.

COLOR PHOTOGRAPHY, a system of photographic reproduction of objects in their own colors, which should not be confused with colored photographs. The successful accomplishment of this has long been desired, and has been the subject of much research and investigation, but even to-day it is generally felt that the best solution has not been found. Although one large manufacturer of photographic apparatus and camera has had a staff of scientists at work on this problem for years, and has had several exhibitions of the work of this laboratory, there has been no introduction of a popular system of color photography.

Early experimenters, such as Edmond Becquerel, G. W. Sempson, and Robert Hunt, produced daguerreotypes and other prints in which colors other than the customary gray or brown appeared.

Modern investigation is along two general lines, one the principles of which were laid down by Gabriel Lippmann, of Paris, which system utilizes the difference in wave number of the different colors.

The other system is founded upon the work of Dr. J. Clark Maxwell, of Cambridge, who proved that, by the proper adjustment of red, green, and blue, any desired color of the spectrum could be produced.

In 1915 Frederick E. Ives introduced a process in which the print is made directly from the negatives upon the print paper, which was a marked improvement. In the Ives process a camera with plates sensitized to red, green, and blue. After exposure the three plates are developed in a tank, and the print from the blue plate is made upon specially prepared paper, while the prints of the red and green negatives are made upon transparent films, which are then laid over the blue print and properly located. From this combined film, any number of prints may be made.

COLOR PRINTING, the art of producing pictures, designs, cards, etc., in various colors by means of lithography, printing from metal blocks, etc. The ordinary methods are: (1) the chromo-lithographic, in which a tracing of the original picture, or the like, is first made and a copy transferred to as many stones as there are colors in the original, every color requiring a fresh stone. The drawing on each stone is made to fit in, or register, with the preceding one, and as the paper passes through the machine an additional color is added every time, and thus the picture is built up color upon color (each being allowed to dry before the next is put on) until it is completed. Some chromos or oleographs may have as many as 25 or 30 printings or colors. (2) Block or surface color-printing is specially adapted for book illustrations or similar work where nicety of detail or rapidity is required.

As in chromo-lithography various printings are necessary; but these, while producing similar effects, are reduced in number by a method of printing several tints of the same color at one operation. Each block, which is usually of zinc and prepared in the usual way, is capable of producing three or more gradations of the same color; the darkest shade from the normal surface, lighter shades being got from parts which have been bitten or corroded in an almost imperceptible degree—the deeper corrosions giving, of course, the lightest shade. When all the tints of one color are thus printed from one block and at one operation, a second block with gradations, in the same way, is used, registering as in chromo-lithography, and so on until the picture is finished.

COLOSSÆ, an ancient town of Asia Minor, in the S. part of the province of Phrygia, on the Lycus river 12 miles E. of Laodicea. It is mentioned by Xenophon as "a populous city, prosperous and great," but in the time of Strabo had become "a small town." It was ruined by an earthquake in 61 A. D.; but it was again rebuilt, and in the Middle Ages was named Chonæ.

COLOSSIANS, EPISTLE TO THE, a letter written to the Colossians by the Apostle Paul either from Rome or Cæsarea, at the same time that he wrote the epistles to the Ephesians and to Philemon. The epistle contains a summary of Christian doctrine, especially dwelling on the divine power and majesty of Christ, and a series of practical exhorta-

tions to specific duties of Christian morality.

COLOSSUS, a Greek word of unknown origin, used to denote a statue very greatly beyond the size of life. The "Bavaria," the "Germania," and our own "Liberty" are noted modern examples. The colossal was the peculiar characteristic of Egyptian art, and innumerable colossi were raised in Egypt, mostly of the hardest stone, many of them from 50 to 60 feet in height. The most celebrated is the vocal statue of Memnon, in the plain of Thebes.

It was in Greece, however, that the most famous colossi appeared; *e. g.*, the bronze statue of Pallas Athene, on the Acropolis of Athens, the plume of whose helmet and the point of whose spear were landmarks to sailors between Sunium and Athens; another statue of the same goddess, of gold and ivory—the so-called Palladium in the Parthenon at Athens; and the Olympian Jupiter, of the same materials, the masterpiece of Phidias.

Among the Seven Wonders of the Old World was reckoned the gigantic Colossus of Rhodes, representing Phœbus, the national deity of the Rhodians. It was erected in honor of the sun by Chares of Lindus, disciple of Lysippus, 290 or 288 B. C. The figure stood upon two moles, a leg being extended on each side of the harbor, so that a vessel in full sail could pass between.

COLPORTEUR (kol-por-ter), a French term now naturalized in the United States, and appropriated to a class of men most commonly employed by societies or associations to distribute religious publications.

COLQUHOUN, ARCHIBALD ROSS, an English traveler and writer, born in 1848. He was engaged in government service in Siam and other eastern countries, and in 1883-1884 made extensive tours of exploration for the purpose of finding a route for a railway between India and China. In 1890 he was appointed Administrator of Mashonaland. He visited Central America in 1895 in an investigation of Panama and Nicaragua canal projects. His numerous books on travel and politics include "The Opening of China" (1884); "English Policy in the Far East" (1885); "Overland to China" (1901); "The Whirlpool of Europe" (1907); "Germany and Sea Power" (1909); and "China in Reformation" (1912). He died in 1914.

COLT, LE BARON BRADFORD, United States Senator from Rhode Island. Born in Dedham, Mass, in 1846, he graduated from Yale in 1868, and from the Columbia Law School in 1870. Later he practiced law in Chicago and Providence, R. I. In 1881 President Garfield appointed him United States District Judge for Rhode Island, and later President Arthur made him a Circuit Judge of the United States. He was elected to the Senate in 1913 for the term 1913-1919, and re-elected in the latter year for the term 1919-1925. A Republican in politics.

COLT, SAMUEL, an American inventor; born in Hartford, Conn., July 19, 1814. He had a common school education and was employed in his father's textile mill; but went to sea as a sailor boy when aged 15. His attention being drawn to fire-arms while at sea, he began to perfect a revolver and patented it in 1835. Its great success led to the erection by him at Hartford of one of the most extensive weapon factories in the world. He died in Hartford, Jan. 10, 1862.

COLTSFOOT, a composite plant, *Tussilago Farfara*. The species now named is cordate, angular, toothed, downy beneath. The flowers are yellow, and come forth in March and April, before the leaves appear. It is abundant in the United States in moist and clayey soils. The leaves have been used medicinally as an infusion, or have been smoked like tobacco for the cure of asthma.

COLUBER, a linnæan genus, comprehending all the snakes now included under the family *Colubridæ*. The same genus, as limited by Cuvier and his successors, is the typical one of the family *Colubridæ*, and the sub-order *colubrina*. The species are very numerous, some of them beautifully colored, and all are harmless. For a long time the common snake of England was called *C. natrix;* now it is termed *Natrix torquata*, or *Tropidonotus Natrix*. *C. dumfriesensis* of Sowerby is probably an immature variety of the common species. *C. austriacus* is common in Germany and France. *C.* or *Boscanion Constrictor*, the black snake of Catesby, is common in all the Southern and South Atlantic States. It is very useful in destroying rats and kindred vermin. It sometimes attains a length of eight or nine feet.

COLUMBA, or COLUMBA NOACHI (Lat. "Noah's dove"), a small constellation S. of Lepus and Canis Major. It is situated between Puppis, Pictor, Cælum, Lepus, and Canis Major.

COLUMBA, ST., a native of Ireland (Gartan in Donegal); born in 521. In 545 he founded the monastery of Derry,

and subsequently established many churches in Ireland. About 563 he landed in the island of Hy, now called Iona, and founded his Church. About 565 he went on a mission of conversion among the northern Picts, and traversed the whole of northern Scotland, preaching the Christian faith and founding monasteries, subject to that which he had set up on the island of Hy. The Columban Church was in some points of doctrine and ceremonial opposed to that of Rome. Shortly before his death he revisited Ireland. There is a well-known life of St. Columba, "Vita Sancti Columbæ," written by St. Adamnan, abbot of Iona. He died in Iona, 597.

COLUMBANUS, ST., a monk; born in Ireland about 540. He went to France in 590, and founded the celebrated monastery of Luxeuil, over which he presided for 20 years. The enmity of Queen Brunehaut caused him to be ordered back to Ireland, from whence he journeyed into Italy, where he founded the monastery of Bobbio in 615. The order of the Columbans was united to that of the Benedictines in the beginning of the 8th century.

COLUMBARIUM, a dove-cote or pigeon-house. When used in the singular Columbarium also signifies a particular kind of sepulchral chamber used by the Romans to receive the ashes of bodies which had been burned.

COLUMBELLA, a genus of mollusks, of the family *Buccinidæ;* small, prettily marked shells, with a long narrow aperture, a thickened and dentated outer lip, a crenulated inner one, a small lamellar operculum. Recent species known 205, fossil 8. The former are from the subtropical and tropical parts of the old and new worlds; the latter from the Tertiary.

COLUMBIA, a city of Missouri, the county-seat of Boone co. It is on the Wabash and the Missouri, Kansas, and Texas railroads. Its manufactures include lumber, elevators, packing, and shoes. There are also important farming, fruit-growing, and stock-raising industries. The city is the seat of the University of Missouri, Christian College, Bible College, and Stephens College. It has also several institutions for the education of women. There is a United States Government weather station and a memorial hospital. Pop. (1910) 9,662; (1920) 10,681.

COLUMBIA, a city of Lancaster co., Pa.; on the Susquehanna river, the Philadelphia and Reading, and the Pennsylvania railroads and the Pennsylvania and Susquehanna canals; 10 miles W. of Lancaster. The Susquehanna, here over a mile wide, is crossed by a bridge connecting with Wrightsville. This bridge is one of the longest in the United States. Columbia is the trade center for Lancaster and surrounding counties, and has numerous silk and lace mills, sugar refineries, ironworks, and brush factories. It is connected by electric railways with all nearby towns, and is lighted by electricity. It is the seat of Franklin and Marshall College, and has a public library, St. Peter's convent school, several newspapers and National banks. The city was founded as Wright's Ferry in 1726, by Quakers, and in 1798 it was one of the places voted upon for the National capital. The original bridge crossing the Susquehanna was burned in 1863 to prevent the Confederates marching on Philadelphia. Pop. (1910) 11,454; (1920) 10,836.

COLUMBIA, city, capital of the State of South Carolina, and county-seat of Richland co.; on the Congaree river near the junction of the Broad and Saluda rivers, on five railroads, and the Columbia canal. The city is built on a bluff, 15 feet above the river, has a fine park, and is noted for its beautiful shade trees and flower gardens.

The industries of the city are important, and include manufactures, cotton, fertilizers, lumber, iron, etc. There are National and private banks.

The city is well supplied with water and gas, and has abundant sources of water-power. The most noteworthy buildings include the State House, costing about $4,000,000; Executive Mansion, State Penitentiary, Insane Asylum, United States Government Building, City Hall, University of South Carolina, College for Women, Lutheran Seminary, Allen University, and a Presbyterian theological seminary.

Columbia was laid out in 1786, and the State Legislature first met there in 1790. During the Civil War a large part of the city was burned by the Federal troops, destroying the old State House with an extensive library, a convent, several churches, and the railroad depot. Pop. (1910) 26,319; (1920) 37,524.

COLUMBIA, a city of Tennessee, in Maury co. It is on the Louisville and Nashville, the Nashville, Chattanooga and St. Louis, and the Nashville, Florence and Sheffield railroads, and on the Duck river. It is the center of an important agricultural region and is also of industrial importance. There are flour mills, lumber mills, marble works, phosphate works, etc. The city has a court house, military academy, a library, a

hospital, and a school for young women, Pop. (1910) 5,574; (1920) 5,526.

COLUMBIA, DISTRICT OF. See DISTRICT OF COLUMBIA.

COLUMBIA RIVER, after the Yukon the largest river on the W. side of America; rises in British Columbia, on the W. slope of the Rocky Mountains, near Mounts Brown and Hooker, in about lat. 50° N.; has a very irregular course, generally S. W. through Washington; forms the N. boundary of Oregon for about 350 miles; and enters the Pacific by an estuary 35 miles long and from 3 to 7 wide. Its estimated length is 1,400 miles. The area drained by this stream and its affluents, of which the largest are Clarke's Fork and the Snake river (with very remarkable cañons), has been computed at 298,000 square miles. The river is broken by falls and rapids into many separate portions, and the ingress and egress are embarrassed by a surf-eaten bar. Still, it is open to steamboat navigation from its mouth to the Cascades (160 miles), and goods are carried past the obstruction, for 6 miles, by railway; the next reach, of 50 miles, extends to Dalles, where another railway, of 14 miles, has been constructed past the Great Dalles channel; and immediately above this are two sections, of 185 and 250 miles respectively, navigable for small steamboats. The extraordinarily abundant salmon-fisheries of the Columbia have been largely developed.

COLUMBIA UNIVERSITY, an institution for higher education, in New York City. It was incorporated in 1754 as King's College. In 1784 the State Legislature passed an act vesting the property of King's College in the regents of the State of New York, and changing the name of the college to Columbia College. This act was repealed in 1787, and by a new charter granted by the State the property and franchises of King's College were vested in the trustees of Columbia College. From 1857 to 1897 the university was situated at 49th street and Madison avenue, New York. In the latter year it was removed to its present location on Morningside Heights. The university includes Columbia College, Barnard College, founded in 1899, which is an under-graduate college for women, the Graduate School, Schools of Political Science, Philosophy, Pure Science, the College of Physicians and Surgeons, School of Mines, School of Engineering, Teachers' College, College of Pharmacy, School of Journalism, School of Architecture, School of Business, and School of Dentistry. The university also maintains a summer session of six weeks in which are offered courses that are accepted as partial fulfillment of the requirements of certain academic degrees and diplomas. There is also a system of extension teaching for men and women who are engaged in teaching and can give only a portion of their time to study. The property of the university is valued at about $72,000,000, of which about $35,000,000 has been added by gift or bequest in the past twenty years. The annual expenses amount to about $6,500,000. The teaching staff in 1920 numbered 1,150. The total enrollment in all courses and departments is 28,314. President, Nicholas Murray Butler.

COLUMBIAN UNIVERSITY. See GEORGE WASHINGTON UNIVERSITY.

COLUMBIDÆ, a family of birds, the typical one of the sub-order *columbacei*. The bill is moderate and compressed, having at its base a soft skin in which the nostrils are placed. The feet have three divided toes before and one behind.

COLUMBINE, a popular name for *Aquilegia vulgaris* or other species of the genus *Aquilegia*. The common columbine has drooping purplish-blue flowers with five flat sepals; five petals, with long spurs, often curved; five follicles, the root-leaves twice or thrice ternate, the others singly ternate. The word is also applied to a female character in the Italian comedy, the "Daughter of Cassandra," and the mythic Harlequin, and to the female dancer in the English pantomime.

COLUMBITE. A mineral containing iron, columbium, and usually manganese and tantalum. Its formula is commonly given as $(Fe, Mn)(Cb, Ta)_2O_6$. Occurs as opaque orthorhombic crystals, dark brown or black in color; specific gravity about 6.0. The mineral is found in Colorado, Connecticut, Maine, North Carolina, South Dakota, Virginia, and in Norway, and is of interest because the element Columbium was first discovered in it by C. Hatchett, in 1802, the name being given because the mineral in which the metal was found came from America.

COLUMBUS, a city and county-seat of Muscogee co., Ga.; on the E. bank of the Chattahoochee river; on the boundary line between Georgia and Alabama; and on the Central of Georgia, the Southern, and the Seaboard Air Line; 100 miles S. W. of Macon. It is connected by steamship lines with Appalachicola, Fla. On account of its large and important manufacturing interests it is known as the "Lowell of the South." The city is regularly laid out with an excellent street system.

Columbus is one of the leading cotton manufacturing cities in the South. It uses over 100,000 bales of cotton for manufactures annually. In addition there are manufactories of cotton-seed oil, barrels, agricultural machinery, fertilizers, etc. The city has several National banks, newspapers, public library, conservatory of music, and other public institutions.

The noteworthy buildings are the Court House, Georgia Home Insurance Co., Bank of Columbus, Garrard Building, and numerous churches. Four handsome bridges connect Columbus with its suburbs in Alabama.

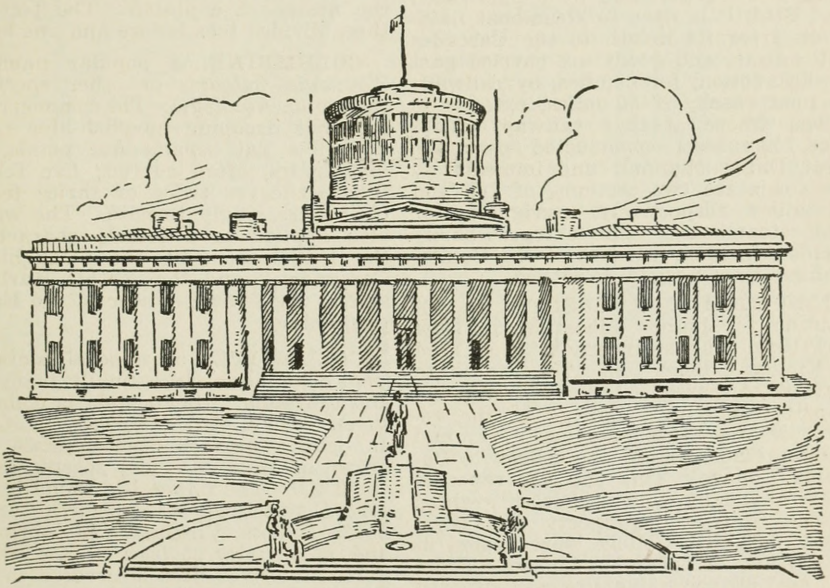
History.—Columbus was laid out in 1828; incorporated as a city in 1829; and captured by the Federal forces, April 16, 1865. Pop. (1910) 20,554; (1920) 31,125.

COLUMBUS, a city of Indiana, the county-seat of Bartholomew co. It is on the Pittsburgh, Cincinnati, Chicago and St. Louis, and the Cleveland, Cincinnati, Chicago and St. Louis railroads, and on the White river. It is an important manufacturing city. Among the industries are the making of tanned leather, threshing and saw-mill machinery, gasoline engines, flour, furniture, etc. Pop. (1910) 8,813; (1920) 8,990.

COLUMBUS, a city, and county-seat of Lowndes co., Miss.; on the Mobile and Ohio and Southern railroads and the Tombigbee river; 150 miles S. E. of Memphis and the same distance N. E. of Jackson. It is the farming trade center of the country; it is the seat of the State Industrial Institute and College, Franklin Academy, and the State bank, Court House, several weekly and semi-weekly newspapers. Pop. (1910) 8,988; (1920) 10,501.

COLUMBUS, a city of Nebraska, the county-seat of Platte co. It is on the Union Pacific and the Chicago, Burlington, and Quincy railroads, and on the Loup river. There are flour mills, foundry, shoe factory, and other industries. The city has a hospital and a public library. Pop. (1910) 5,014; (1920) 5,410.

COLUMBUS, a city, capital of the State of Ohio, and county-seat of Franklin co.; on both sides of the Scioto river, about 70 miles from its mouth; and 100 miles N. E. of Cincinnati. It is the center of 11 railroad lines, and the third city in the State in population and importance. Area, 16½ square miles.



STATE HOUSE, COLUMBUS, OHIO

There are over 800 manufacturing establishments, with an annual product valued at about $100,000,000. Among the chief products are wagons, boots and shoes, tobacco, and machine shop products. There are eight National banks. The exchanges in the clearing house for the year ending Sept. 30, 1919, were $638,410,000.

There are excellent street and sewer systems. The noteworthy buildings are the United States Government Building, containing the Postoffice and Federal

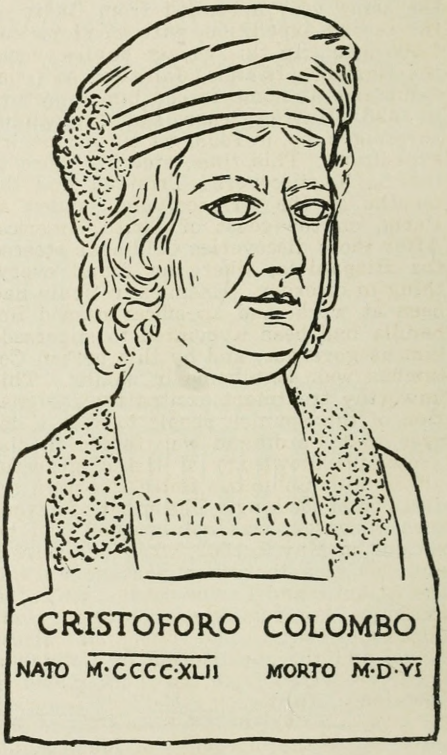
Court; the State Capitol; the Ohio State University; Central Ohio Insane Asylum; Odd Fellows' Hall; Masonic Temple; the Franklin County Court House; Soldiers and Sailors' Memorial; Columbus Public Library; and Y. M. C. A. building, and among 70 Protestant and 10 Roman Catholic churches are: Trinity Church (P. E.), St. Joseph's Cathedral (R. C.), Second Presbyterian, St. Paul's (Germ. Luth.), Broad Street (M. E.), Wesley Chapel, and the Third Avenue. The educational institutions include the Ohio State University, Columbus Normal School, Capital University, and several public and private high and secondary schools.

History.—Columbus was laid out in 1812; became the seat of the State government in 1816; and was incorporated as a city in 1834, with a population of less than 4,000. Pop. (1910) 181,548; (1920) 237,031.

COLUMBUS, CHRISTOPHER, the Latinized form of the Italian *Colombo,* and the Spanish *Colon,* the great navigator who added a new hemisphere to our globe; born near Genoa, probably in 1451. He was the son of a wool-comber; attended for some little time the school of learning in Pavia, where he evinced a taste for astronomy and cosmography; and early went to sea, and made several voyages in the Mediterranean. Settling in Lisbon, in 1470, he married the daughter of an Italian named Palestrello, once a navigator in the Portuguese service, and with her obtained some valuable charts, journals, and memoranda. While constructing maps and charts for the livelihood of his family, Columbus gained the belief of a great land in the west.

To qualify himself for his great enterprise he made several voyages to the Azores, the Canaries, and the coast of Guinea—then the limit of European navigation in this direction. Not until about 1482 or 1483 did he find opportunity to lay his scheme before John II. of Portugal. This monarch referred it to a junta of nautical and scientific men, who decided against it. The king, however, taking advantage of a detailed plan obtained from Columbus under false pretenses, secretly sent out a vessel to examine the route. Too timid to venture far from the beaten track, the pilots soon returned to Lisbon to throw ridicule on the project. Disgusted with the duplicity of his sovereign, Columbus secretly left Lisbon in 1484, taking with him his motherless boy Diego. He found his way to Genoa, where the republic treated his project with scorn. Disappointed, but not despairing, Columbus turned his steps toward Spain. Weary and hungry, he stopped one day at the gate of the Franciscan convent, La Rabida, in Andalusia, to beg some bread and water for his child. This day was the turning-point in his career. The superior of the convent, Juan Perez de Marchena, passing at the moment, entered into conversation with the traveler, and was so struck with the grandeur of his views that he used all his influence to procure him the favorable consideration of Ferdinand and Isabella, and it was to the latter, not the king, to whom he owed assistance in his project.

Eight years of disappointment passed, during which Columbus applied to other

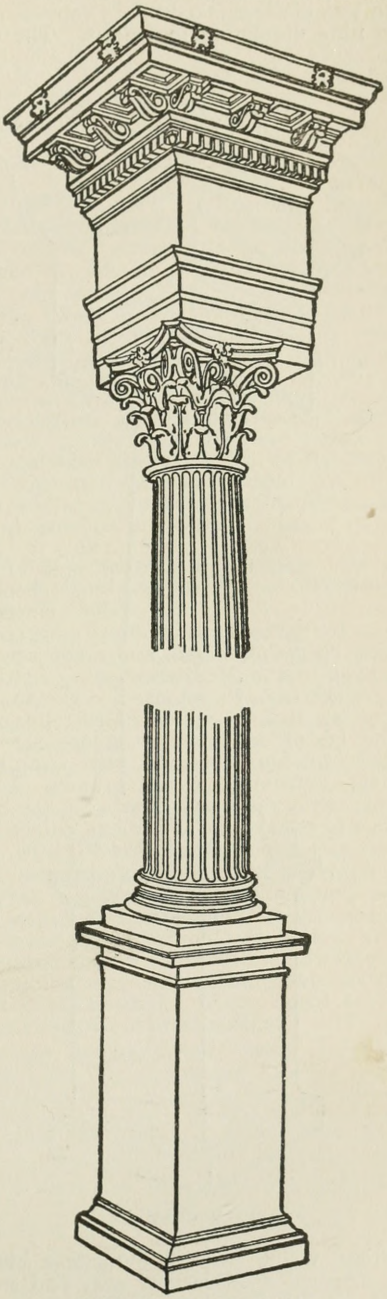


CHRISTOPHER COLUMBUS

courts, and without avail, when he found himself in command of three small vessels, only one of which was decked, with 120 men, ready to start on his adventurous enterprise. Columbus claimed, as reward, to be nominated high-admiral and governor-general and viceroy over all the lands he discovered, with a tenth of the produce of the countries. On Aug. 3, 1492, he set sail from the bar of Saltes, near Palos. Delaying a month at the Canaries to refit, he started thence, on Sept. 6, over unknown seas. His crew soon be-

came openly mutinous, but Columbus never flinched in his determination to press on. On Oct. 12 his perseverance was rewarded with the sight of land, which proved to be one of the Bahama Islands. Here he solemnly planted the cross, giving the island the name of San Salvador. After discovering several other of the West India Islands, including Cuba and Haiti, or San Domingo, at the latter of which, called by him Hispaniola, he settled a small colony, he set sail again for Spain, where he arrived March 15, 1493, and was received with every demonstration of joy and admiration by the people and the court. In September of the same year he sailed from Cadiz on the second expedition, with 17 ships and 1,500 men. In this voyage he discovered the Caribbee Islands, Jamaica, etc., but calumnies at home forced him to return in 1496. Having cleared himself with his sovereigns, he, in 1498, set out on a third expedition. This time, steering more to the S., he discovered Trinidad and the mouths of the Orinoco, and landed at Paria, on the coast of South America. After these discoveries Columbus steered for Hispaniola, where he found everything in disorder. Enemies in Spain had been at work, and an officer named Bobadilla had been appointed to supersede him as governor, and by this person Columbus was sent home in chains. This unworthy treatment excited the indignation of the Spanish people to such a degree that Ferdinand was forced to disavow all knowledge of the disgraceful affair. But Columbus failed to obtain redress from the king. The spirit of adventure, however, was not crushed and he set out on May 9, 1502, with four vessels and 150 men to seek a passage uniting the Atlantic and Pacific oceans, which he imagined lay somewhere between Honduras and Paria. The voyage was disastrous, and the constitution of Columbus never recovered from the shock which it sustained. In coasting Central America he got a hint which, if followed up, might have led to the discovery of Mexico and the Pacific; but the mutinous character of his crew forced him aside to seek for gold, and having added little of importance to his previous discoveries, he returned to Spain in November, 1504. Isabella was dead; Ferdinand proved basely ungrateful, and he was permitted to die in poverty at Valladolid, on May 20, 1506.

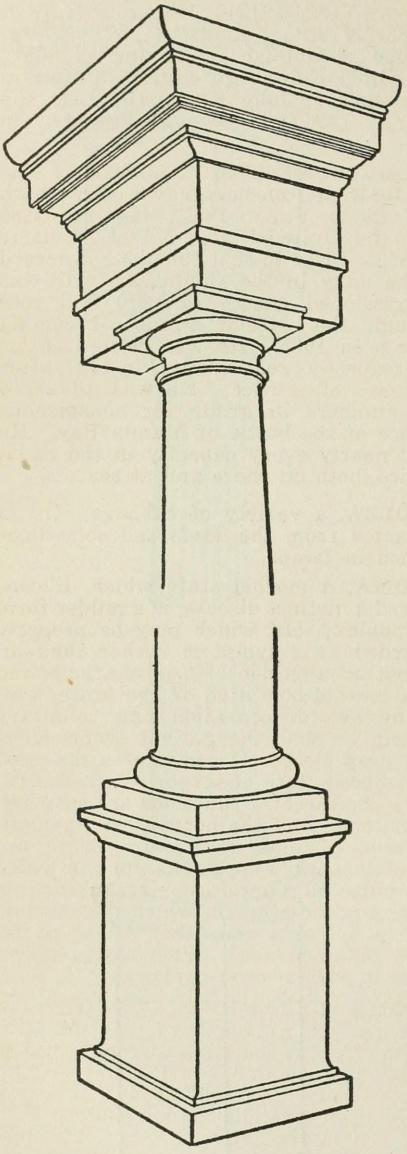
COLUMN, a pillar, shaft, or solid body of considerably greater length than thickness, standing upright, and generally serving to support some superincumbent mass. It is the principal part in the ancient orders of architecture. There are five orders of architecture, each having its own proper style of column. The Grecian-Doric has no base, and in some other



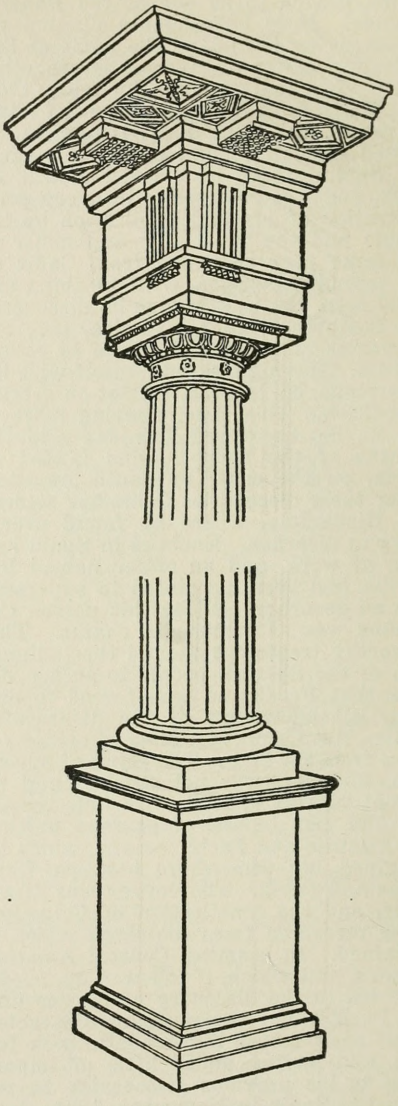
CORINTHIAN COLUMN

respects differs from the Roman Doric, which is an imitation of it. It was short, powerful, and massive, and very simple

in character. Its height was between seven and eight diameters. The Ionic column was distinguished by its volutes, and was nine diameters in height. The Corinthian, which was 10 diameters high, was adorned with leaves, etc., and was noted for its lightness and richness of decoration. Of these the Doric and Ionic were the earliest and oftenest employed in Greek architecture. The Corinthian was preferred by the Romans. The parts of a column are the plinth, the torus, the shaft, the astragal, the neck, the ovato, the abacus. Above these rose the entablature.



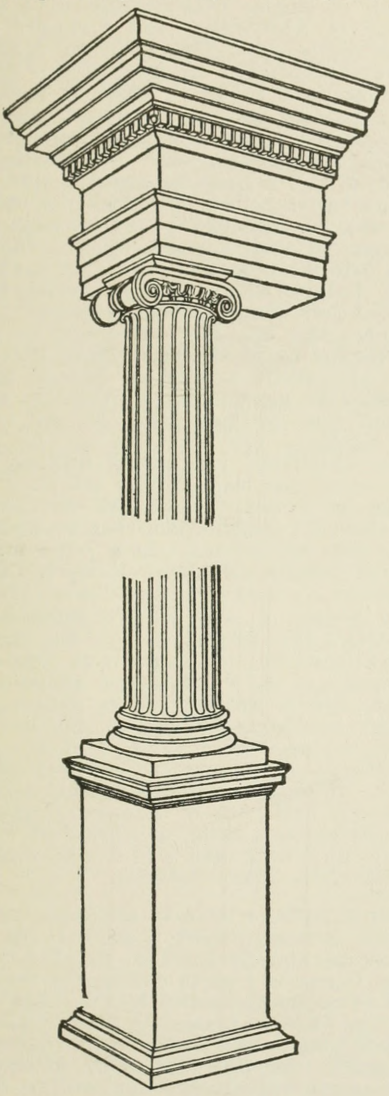
TUSCAN COLUMN



DORIC COLUMN

COLUMN, in military tactics, a formation of troops drawn up in deep files, showing a small front; as distinguished from line, which is extended in front and thin in depth. They are said to be close or open, according to the intervals between the battalions, regiments, etc., of which they are composed. Sometimes the name column is given to a small army, especially when actively engaged.

COLURE, one of the two imaginary great circles of the celestial sphere intersecting the poles of the world; one passing through the equinoctial points of



IONIC COLUMN

Aries and Libra and the pole of the equator; and the other through the solstitial points of Cancer and Capricorn, and the poles both of the ecliptic and equator. For this reason the first is called the equinoctial, and the second the solstitial Colure. The name is supposed to have been given to them because a portion of these circles is always concealed from view under the horizon.

COLVIN, SIR SIDNEY, an English critic; born in Norwood, England, June 18, 1845. He became professor of fine arts at Cambridge in 1873. He was keeper of prints and drawings, British Museum (1884-1912). He wrote "Life of Landor" (1881); "Keats" (1887); "Early History of English Engraving" (1905); and edited Edinburgh edition of Stevenson's works; "John Keats, His Life and Poetry" (1917). He was knighted in 1911.

COLVOCORESSES, GEORGE PARTRIDGE, an American naval officer, born in Norwich, Vt., in 1847. He graduated from the United States Naval Academy in 1869. Prior to that time he had served in the navy in the Civil War. He was commissioned ensign in 1870 and rose through the various grades, becoming captain in 1905. He was retired at his own request as rear-admiral in 1907, after 45 years of service. He was advanced five numbers in grade for conspicuous service at the battle of Manila Bay. He filled nearly every capacity in the naval service, both on shore and at sea.

COLZA, a variety of cabbage. Oil is extracted from the seeds and sometimes burned in lamps.

COMA, a morbid state which, if considered a distinct disease, is a milder form of apoplexy, but which may be properly regarded as a symptom rather than an idiopathic affection. It is characterized by a morbid condition of the brain, producing loss of sensation and voluntary motion, so that the patient seems as if in a deep sleep. It constitutes the most pronounced state of torpor which can occur. The cerebral functions are suspended in coma, and the nervous and sanguiniferous systems deranged. There are two well-marked types of it, one in which the pulse is oppressed, irregular, and slow; and the other in which it is strong, with a hot skin and other marks of febrile inflammation. When coma is intense it passes into apoplexy.

COMA BERENICES ("the Hair of Berenice"), a northern constellation whose origin is sometimes wrongly stated. In his introduction to "Ptolemy's Catalogue" Baily says that though it was a well-known constellation long before Ptolemy's time the latter did not introduce it into the Almagest as a distinct constellation, but called it *Plokamos* (Gr., "hair," or "curls"). It appears to have been restored as a distinct constellation by Tycho Brahe in his catalogue, published after his death, in 1602. It is made up of rather faint stars, none of them brighter than the fourth magnitude. The constellation is surrounded by Ursa Ma-

jor, Canes Venatici, Boötes, Virgo, and Leo.

COMANCHES, an aboriginal tribe of North American Indians, whose hunting grounds were the regions now known as Texas and northern Mexico. They were very numerous between 1700 and 1750, having a tribal organization under chiefs of their own selection. They hunted on horseback, and were estimated to number 400,000 when first encountered by the whites. They have dwindled to about 2,000 and now live on a reservation opened in 1901 in Oklahoma.

COMAYAGUA, a city of Honduras, Central America, situated in a fertile valley, 1,935 feet above the sea, on the Rio Humuya, 190 miles E. of Guatemala. Founded in 1540, it has a handsome cathedral and a college, and before 1880 was the capital of the republic. Pop. about 3,100.

COMB, a toothed implement used in every age and by all peoples for dressing and keeping clean the hair. Combs are also used for fastening the hair when dressed, and as head ornaments. Combs are made of horn, tortoise shell, ivory, wood, bone, metal, india-rubber, celluloid, and composition. Saw-cutting is the only process available for bone, ivory, and wooden combs, and it is used for the finer kinds of horn combs also. India-rubber combs, now so extensively used, are manufactured by pressing the caoutchouc to the required form in molds, and "vulcanizing" or combining it with sulphur afterward.

COMB, the wax cavities in which bees lodge their honey. The comb of a bee is composed of hexagonal cells, of which there are two tiers, the cells in which are placed end to end, so that the three plates of wax, which serve as the bottom of the cell in the one tier, constitute also that of the corresponding one in the other.

COMBACONUM (*Kumbhakonam*), one of the oldest and most sacred cities of India, in the center of the fertile Kaveri delta, 193 miles S. W. of Madras, with Hindu temples, a government college, etc. Pop. about 64,000.

COMBINATION, in law, a combination to commit a crime is an indictable CONSPIRACY (*q. v.*). A combination to commit an act which is injurious, immoral, or contrary to public policy, is in some but not in all cases held to amount to conspiracy. Combinations of workmen to raise the rate of wages were formerly unlawful; but the law was amended in this respect in 1825, and now such combinations are freely permitted, provided they effect their purposes by lawful means.

In mathematics, the different collections which may be made of certain given quantities without regard to the order in which they are arranged in each collection. The term is almost always mentioned in conjunction with permutations in which there is regard to the order of the quantities, and a department of arithmetic is technically called Permutations and Combinations. If *a*, *b*, and *c* be three quantities to be taken two together, there will be three possible Combinations, that is, ways of arranging them in pairs, without allowing *b* to stand before *a*, or *c* before the two letters which precede it in the alphabet. These combinations will be *ab*, *ac*, and *bc*. But there can be six permutations of the same three letters, *i. e.*, six distinct pairs of them if permission be granted to put them in any order one pleases, viz., *ab*, *ba*, *ac*, *ca*, *bc*, *cb*.

In chemistry, the act of uniting by means of chemical affinity; the state of being so united. There are two kinds of chemical combination, that by weight and that by volume. In a large number of instances the law relating to Combination by weight is as follows: When two bodies, A and B, are capable of uniting, the several quantities of B, which combine with a given or constant quantity of A, stand to one another in very simple ratios. With regard to gases combining by volume, the law is that the combining volumes of all elementary gases are equal, excepting those of phosphorus and arsenic, which are only half those of the other elements in the gaseous state, and those of mercury and cadmium, which are double those of the other elements.

COMBLES, a town in the department of the Somme, France, 7 miles N. W. of Peronne, and 20 miles S. E. of Arras. The Germans took it during the second battle of the Somme in March, 1918, inflicting heavy losses on the British, mostly South Africans, under General Dawson, who was captured. Attempts at counter-attack were unavailing, till the arrival of American forces and the general retreat of the Germans.

COMBRETACEÆ, in botany, *Myrobalans*, an order of exogens, alliance *Myrtales*. It consists of trees or shrubs with alternate or opposite entire dotless leaves, destitute of stipules. The flowers are on axillary or terminal spikes. The calyx is adherent, with a 4-5 lobed deciduous limb. The petals, where they exist, rise from the orifice of the calyx.

The stamens are generally twice as many as the segments of the calyx; the ovary one-celled, 2-4 pendulous ovules, style 1, stigma simple. The order is divided into three tribes: *terminaleæ, combreteæ, and gyrocarpeæ.* The *myrobalans* are found within the tropics of Asia, Africa, and America.

COMBUSTION, the act of burning, the state of being burned. Spontaneous Combustion is Combustion occurring without any means taken on the part of man to produce it. A Combustion of the human body produced by occult internal causes is alleged to have occurred several times. Most chemists believe the Combustion of the human body in the way described an impossibility.

COMÉDIE FRANÇAISE, the national subsidized theater of France, formed in 1680 by the fusion of the two bodies into which Molière's company of actors had split. It is at present managed by regulations made in 1812, modified by subsequent resolutions.

COMEDIETTA, a dramatic composition of the comedy class, but not so much elaborated as a regular comedy, and generally consisting of one or at most two acts.

COMEDONES, a name applied to the little cylinders of sebaceous and epithelial substance which are apt to accumulate in the follicles of the skin and to appear on the surface as small round black spots. When squeezed out they have the appearance of minute maggots or grubs, with black heads, and thence have derived their name.

COMEDY, a dramatic representation of a light and amusing nature, in which are satirized pleasantly the weaknesses or manners of society and the ludicrous incidents of life. Comedy took its origin in the Dionysian festivals, with those who led the phallic songs of the band of revelers (Gr., *kōmos*) who, at the vintage festivals, gave expression to the exuberant joy and merriment by parading about, dressed up, and singing jovial songs in honor of Dionysus. Comedy first assumed a regular shape among the Dorians. The first attempts at it among the Athenians were made by Susarion, a native of Megara, about 578 B. C. Epicharmus first gave comedy a new form and introduced a regular plot. That branch of the Attic drama known as the Old Comedy begins properly with Cratinus. It lasted from 458 B. C. to 404 B. C. The later pieces of Aristophanes belong to Middle Comedy. The most distinguished of Roman comic writers were Plautus and Terence.

COMET, a luminous heavenly body which, in general, consists of a nucleus or "head" with, or frequently without, a tail, the whole moving in the heavens, first toward, then around, and finally away again from the sun, like a planet at one part of its elliptic orbit. Comets have in every age excited attention, and, till recently, have inspired terror in the general public, or at least in ignorant minds. Tycho Brahe, about 1577, showed that a certain comet was at a greater distance from the earth than the moon. Hevelius, in 1668, ascertained that the orbit of a comet was concave and not a straight line, the latter erroneous view having been held by Tycho Brahe, already mentioned, and Kepler. Doerfel (1861) believed comets to move in parabolas. In 1682 Halley proved the comet, subsequently called after him, to be periodic in its returns. In 1704 Sir Isaac Newton proved comets to obey the law of gravitation, and held that in all probability they moved in elliptic orbits.

Present state of knowledge and opinion.—More than 600 comets, according to J. R. Hind, have been taken note of, but about 17,500,000 are believed to exist in connection with the solar system. The head or nucleus is much less solid than it seems. Thus, in 1832, Sir John Herschel saw a group of stars only of the 16th magnitude, almost through the center of Biela's comet. When such a body might be expected to exercise gravitation its influence is too small to be perceptible. Regarding orbit, the comets may be divided into two very distinct classes: First, those whose orbits are so long that they are usually regarded as parabolas, and second, those whose orbit and period are both short. Of the latter class, about 12 or 15 are known. The first seem to have come to us from outside space; the second set, originally belonging to the former, to have had their direction changed so as to produce their present short elliptic orbits by the action on them of some planet. In 1866 Professor Schiaparelli, of Milan, discovered that the orbit of Tuttle's comet, the third which had appeared in 1862, was nearly identical with that of the August meteors, and Tempel's comet, the first of 1866, with that of the November meteor stream. In consequence of this discovery, Prof. P. G. Tait published the view that the sudden development of tails many millions of miles in length, the occurrence of comets with many tails, and the observed fact that there is no definite relation of direction between a comet's tail and its solar radius

vector, may be accounted for on the supposition that a comet is a cloud of small masses, such as stones and fragments of meteoric iron, shining by reflected light alone, except where these masses impinge on each other, or on other matter circulating around the sun, and thus produce luminous gases along with considerable modifications of their relative motion. The differences of motion of the meteoric fragments relatively to the earth present appearances analogous to those of a flock of sea-birds flying in one plane, and only becoming as a long streak when the plane of the flock passes approximately through the spectator's eye. The so-called envelopes surrounding them are compared with the curling wreaths of tobacco smoke emitted from a pipe. On June 24, 1881, Wm. Huggins examined the bright comet then in the sky with the spectroscope. Assuming this to be similarly composed to other comets, he came to the conclusion that part of their light is reflected sunlight and part original light, and further that carbon is present in the cometary matter.

Among the best known periodic comets are:

(1) *Biela's Comet:* named after M. Biela, an Austrian officer, who discovered it at Prague on Feb. 27 or 28, 1826, a comet which has a periodic time of about 6½ years or 338 weeks. It returned in September, 1832, again in 1839, then in 1845; when, between Dec. 19, 1845, and Jan. 13, 1846, it separated into two comets, which went off in company, coming back together in 1852, since which time they have returned no more; but it has been discovered that when, toward the end of November, the earth intersects the lost double comet's path, there is a display of meteors. This was notably seen on Nov. 30, 1867, and on Nov. 27, 1872. Biela's is called also Gambart's Comet.

(2) *Donati's Comet:* named after Dr. Donati of Florence, a comet discovered by Donati on June 2, 1858. Periodic time about 2,000 years.

In 1910 two brilliant comets appeared; 1910A and Halley's. The latter had long been expected, but the other was new and came as a surprise to the astronomers. Consult "Story of the Comets," Chambers (1910).

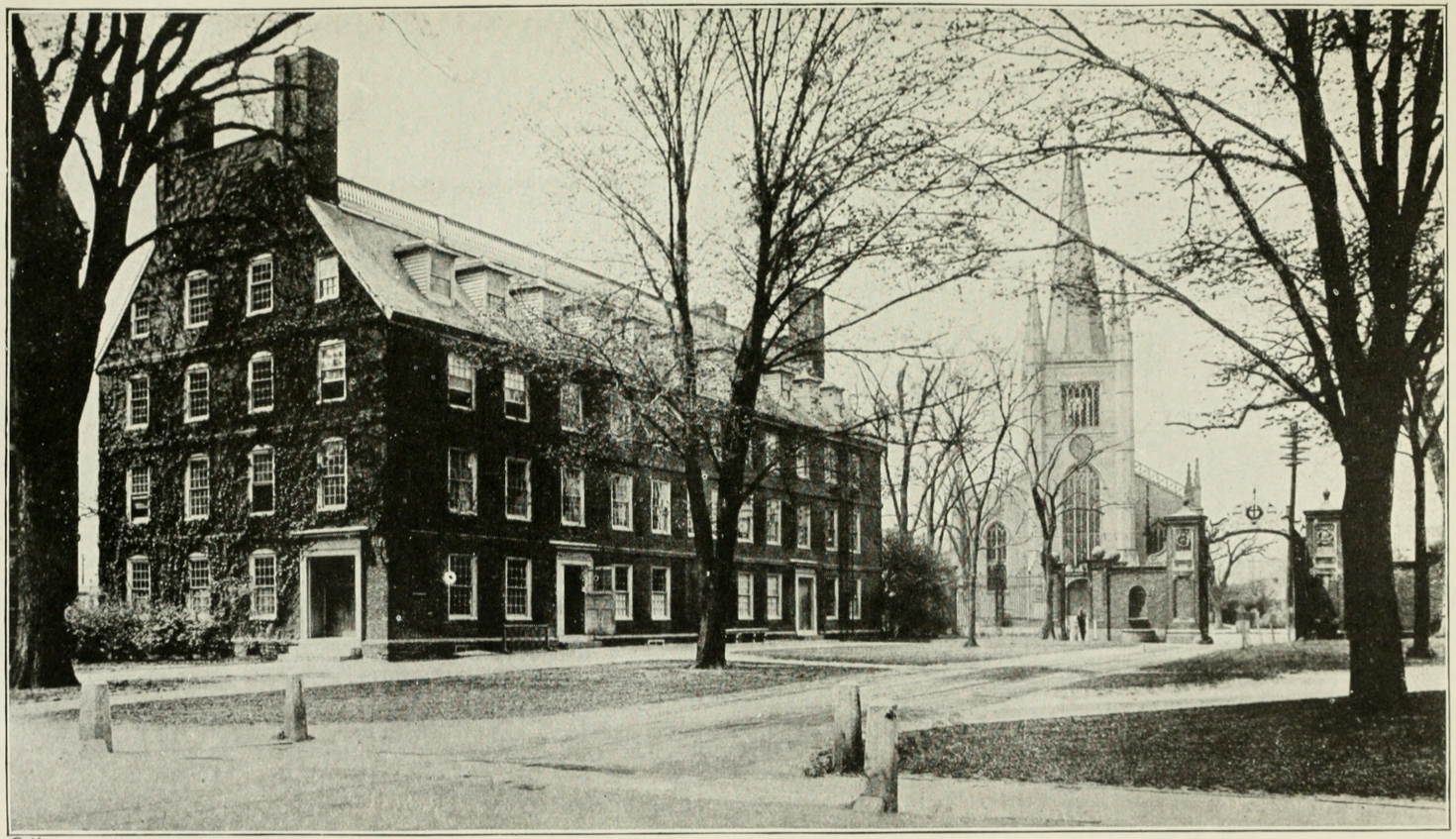
(3) *Encke's Comet:* named after Johann Franz Encke, Director of the Observatory at Berlin, a comet the periodicity of which was detected by Encke in 1819. He proved it identical with Mechain and Messier's comet of 1786, with Herschel's of 1795, and Pons' of 1805. It appeared again in 1822, 1828, and at such intervals as to show that its periodic time is 3.29 years, or 1,210 days. Its orbit is everywhere nearer the sun than that of Jupiter.

(4) *Halley's Comet:* named after the celebrated Edmund Halley, the friend of Newton, and, from 1720 to 1741-1742, English Astronomer-royal, a comet the first whose periodic time was ascertained. It is about 75 years. It was identical with the comets of 1456, 1531, and 1607, and appeared again in 1759 and 1835. This comet was due in 1910 when it appeared in January. Also in the same year a new comet—1910A. Two new comets appeared in 1918, one discovered by Reid, June 12, the other by Bergdorf, Nov. 23. Five comets appeared in 1919, four of which were previously known.

COMFORT, WILL LEVINGTON, an American novelist, born in Kalamazoo, Mich., in 1878. He was educated in the public schools of Detroit. During the Spanish-American War he served in the 5th United States Cavalry. He was war correspondent in the Philippines and China in 1889 and served in the same capacity during the Russo-Japanese War. His books, which acquired a wide circle of readers, include: "Routledge Rides Alone" (1910); "Down Among Men" (1913); "Child and Country" (1916); and "The Shielding Wing" (1918), etc.

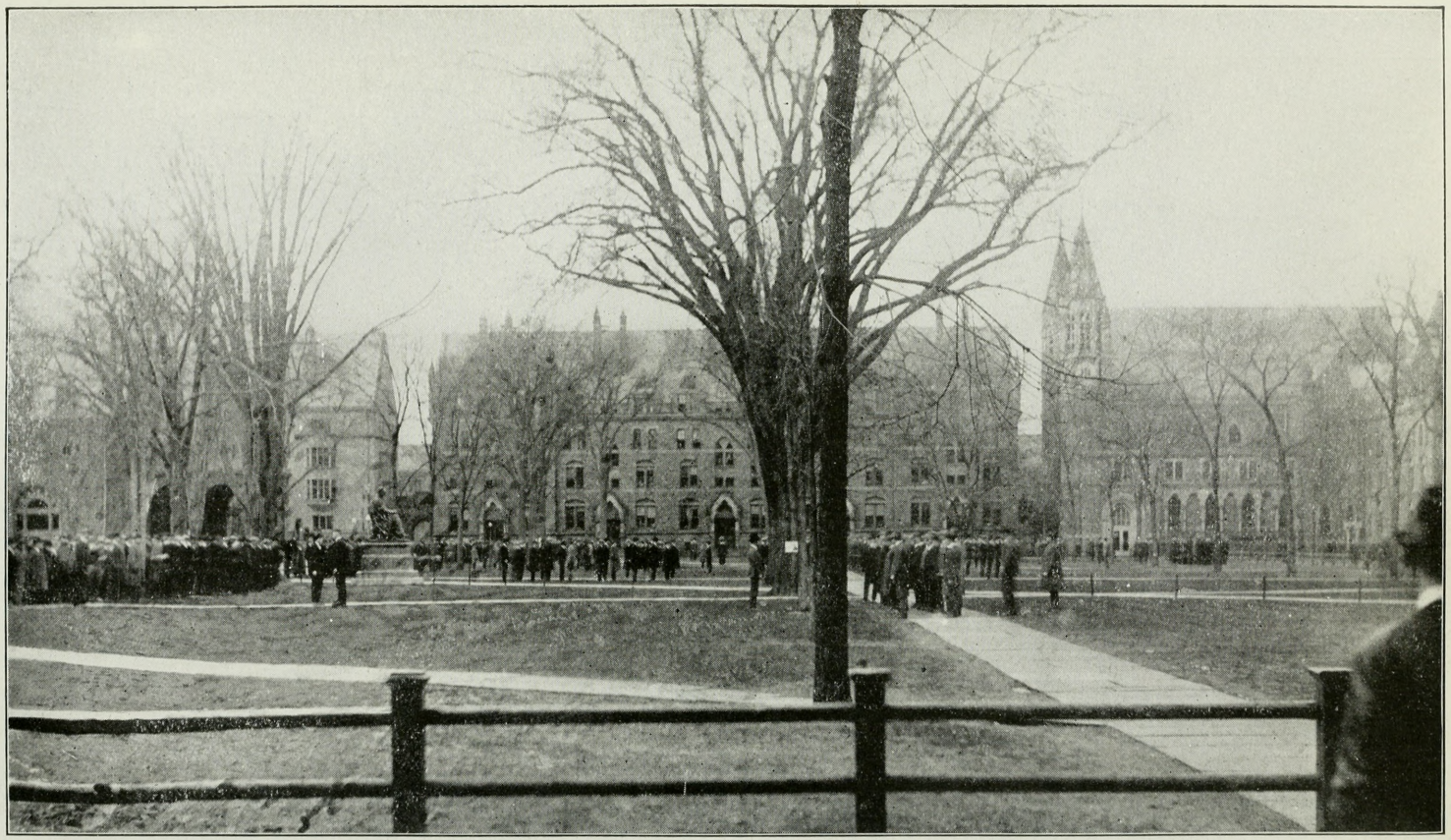
COMFREY, the *Symphytum officinale.* The stem is 2-3 feet high, branched above. The flowers are in pairs, secund, and drooping. The corolla is large, yellowish-white, often purple. The plant is frequently found on the banks of rivers or in watery places generally. It flowers in May and June. It was formerly regarded as a vulnerary. The leaves gathered while young may be used as a substitute for spinach. Comfrey stewed in sugar, with a small amount of paregoric added, makes a highly-prized domestic remedy for coughs and bronchial irritation.

COMINES, PHILIPPE DE (kō-mēn'), a French chronicler; born in Comines, in 1445; was the trusted counselor of Philip the Good, Duke of Burgundy, of his son and successor Charles the Bold, of Louis XI., King of France, and his successor Charles VIII. His "Memoirs" supply the most trustworthy material we have for the history of his age. The first six books were written between 1488 and 1494, and the last two between 1497 and 1501; they were first printed in 1524-1525. He died at the château of Argenton, Oct. 13, 1510.



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MASSACHUSETTS HALL, HARVARD UNIVERSITY, CAMBRIDGE, MASS.

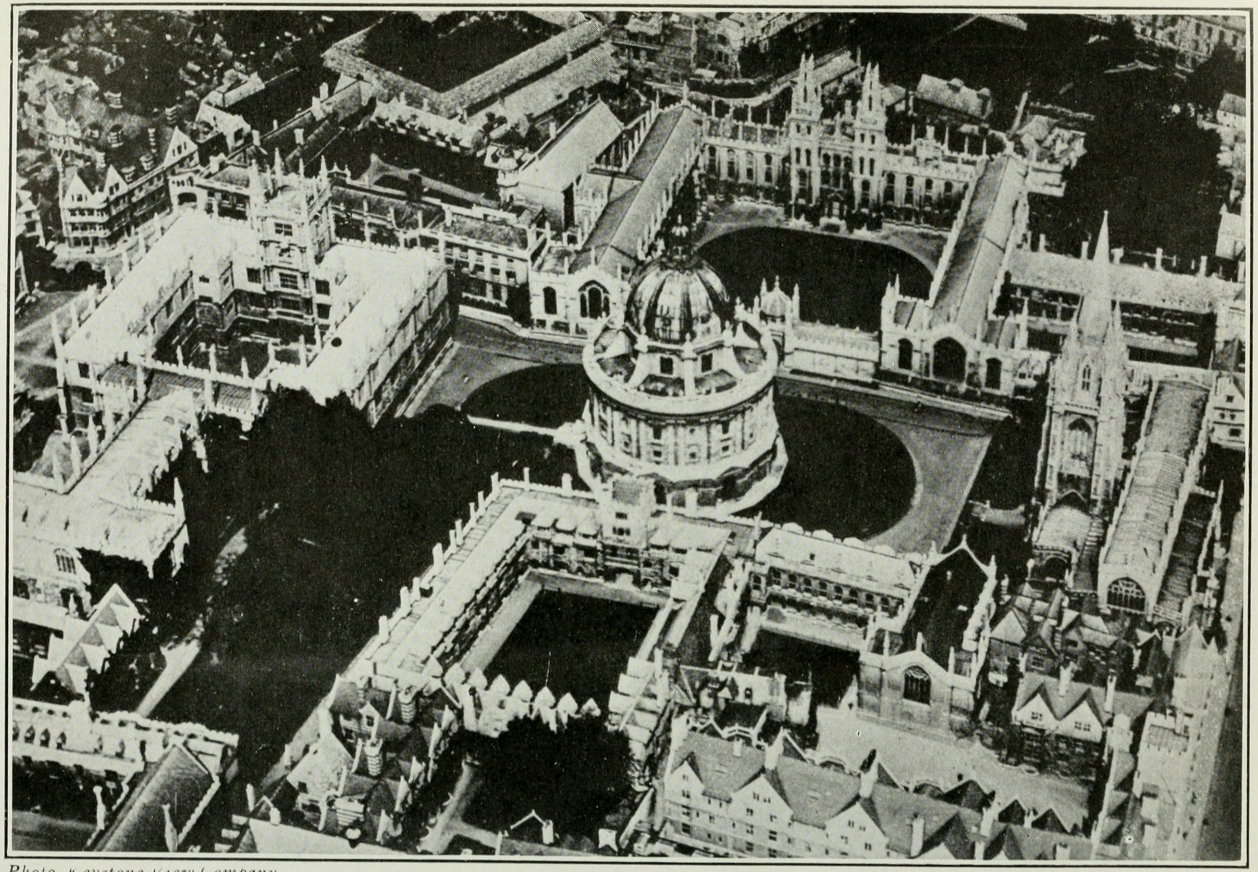


YALE CAMPUS. THE PHOTOGRAPH SHOWS STUDENT VOLUNTEERS ASSEMBLED TO BE ASSIGNED TO DIFFERENT BRANCHES OF SERVICE FOR THE WORLD WAR



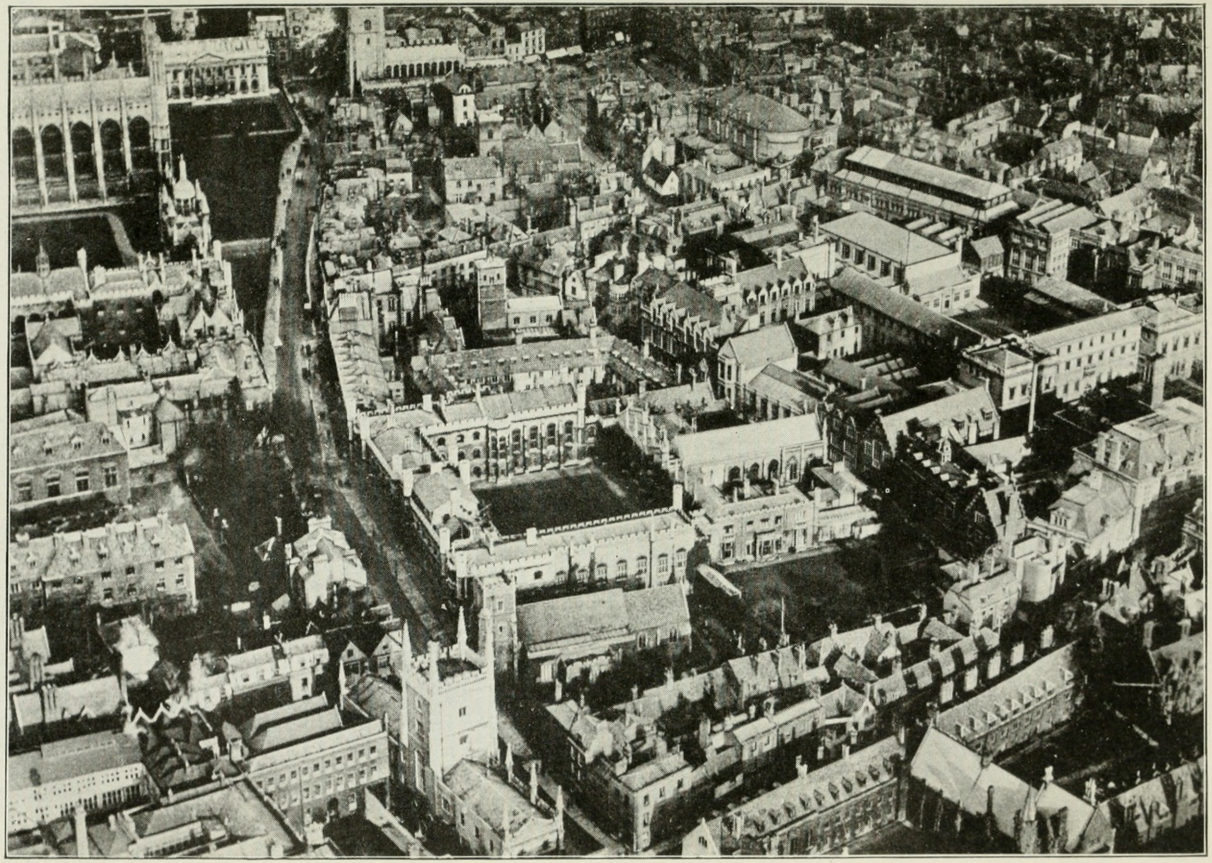
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NASSAU HALL, PRINCETON UNIVERSITY



Photo, Keystone View Company

AN AERIAL VIEW OF OXFORD UNIVERSITY COLLEGE, ENGLAND



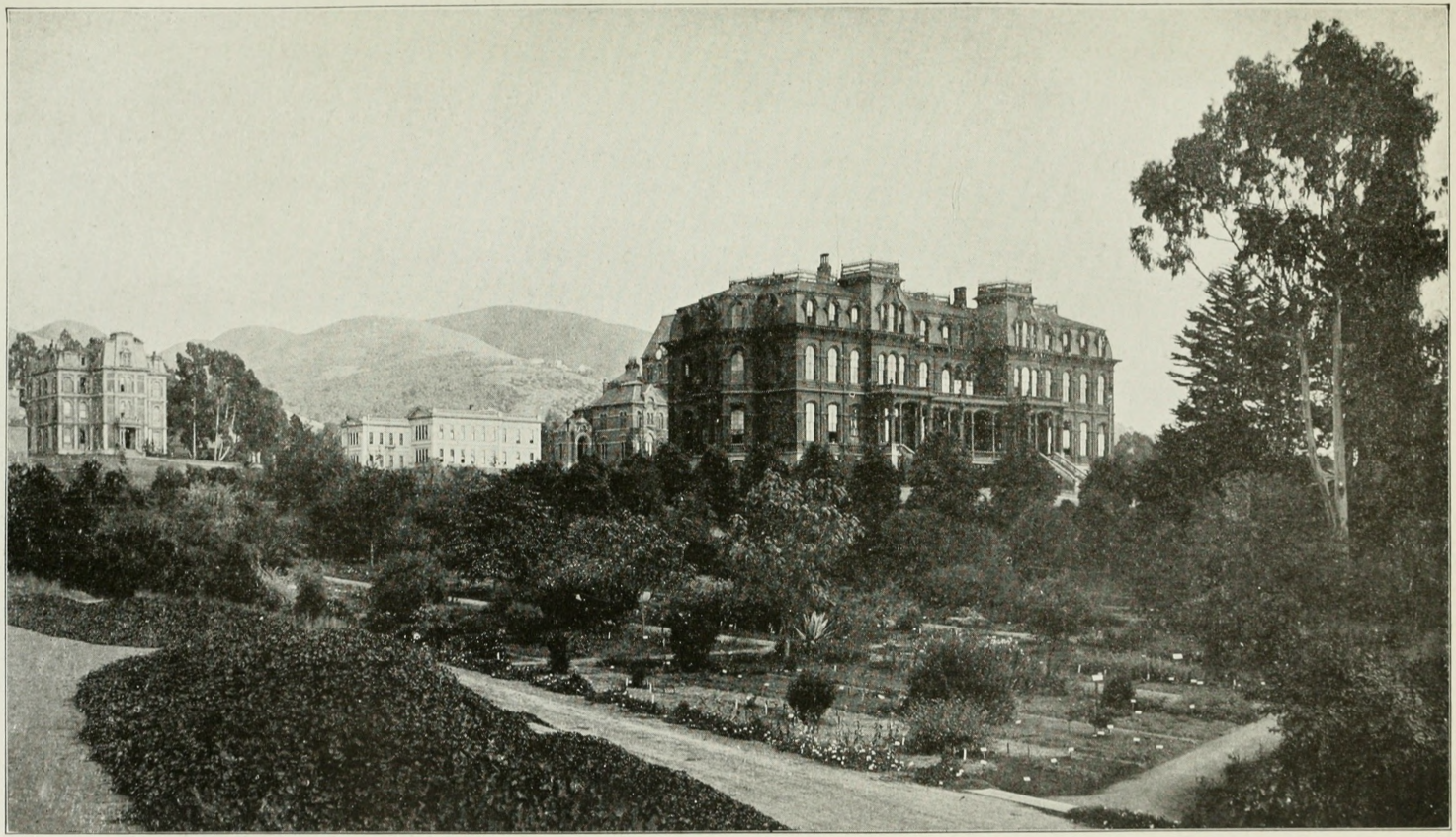
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AN AVIATOR'S VIEW OF CAMBRIDGE UNIVERSITY, ENGLAND



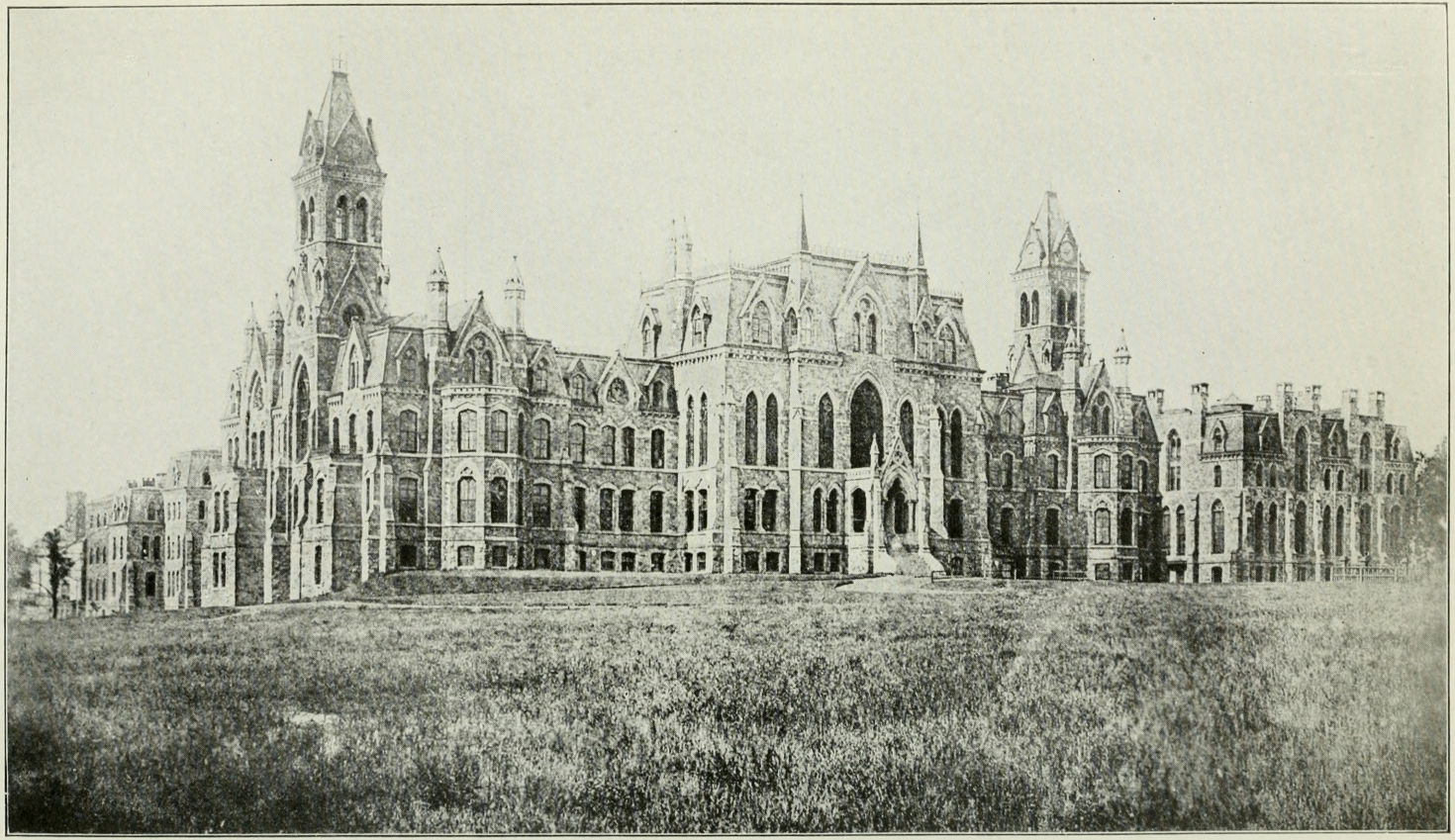
Photo, Brown Bros.

THE COMMONS AND MITCHELL TOWER, UNIVERSITY OF CHICAGO



Photo, Brown Bros.

NORTH HALL, UNIVERSITY OF CALIFORNIA, AT BERKELEY, CAL.



Photo, Brown Bros.

THE UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA, PA.

COMITIA, the ordinary and legal assemblies of the Roman citizens for the passing of laws, election of magistrates and officers, etc.

COMMANDER ISLANDS, a group of four islands off the coast of Siberia, in the Bering Sea. The largest of them, Bering, has an area of 609 square miles, and the next largest, Mednj, 180 square miles, both of them having a small population. The chief industry is the breeding of fur seals, protected by the Siberian Government.

COMMANDITE (kom-män-dēt), a term used in France, a partnership *en commandite* being one in which a person may advance capital without taking an active part in the management of the business, and be exempt from responsibility for more than he put into it; much the same as limited liability.

COMMELYNACEÆ, spiderworts, an order of endogens, alliance *xyridales*. They are herbaceous plants, with flat narrow leaves. The species are found in the East and West Indies, New Holland, Africa, etc.

COMMENDAM, the administration or provisional management of a benefice during a vacancy. The person intrusted with the management was called *commendator*. The grant of ecclesiastical livings in this way gave rise to great abuses. In England the term was applied to a living retained by a bishop after he had ceased to be an incumbent. By 6 and 7 William IV. the holding of livings *in commendam* was, for the future, abolished.

COMMENSAL, messmate; applied in zoölogy to animals which live on or in other animals for part or the whole of their life, simply sharing the food of their host without being parasite on him; thus the pea-crabs live within the cavity of shell-fish, and find their food in the water introduced for the benefit of their host.

COMMENSURABLE, an appellation given to such quantities or magnitudes as can be measured by one and the same common measure. Commensurable numbers are such as can be measured or divided by some other number without any remainder; such are 12 and 18, as being measured by 6 or 3.

COMMENTARY, a term used (1) in the same sense as memoirs, for a narrative of particular transactions or events, as the "Commentaries" of Cæsar. (2) A series or collection of comments or annotations. These may either be in the form of detached notes, or may be embodied in a series of remarks written and printed in a connected form.

COMMERCE, a mutual exchange, buying and selling, whether abroad or at home, but in a more specific or limited sense it denotes intercourse or transactions of the character now described with foreign nations or with colonies; mutual exchange or buying and selling at home being designated not commerce but trade.

History.—The Phœnicians, whose primitive seat was at Sidon and their next at Tyre, were the great commercial nation of the old world. The Greeks with all their intellect, and the Romans with their unparalleled opportunities, did not show remarkable aptitude for Commerce, nor was their success high.

In the Middle Ages, the Venetians, the Pisans, the Genoese, the Hanse or Hanseatic towns and Flanders, either successively or in some cases two or more together, took the lead in Commerce. The great impulse communicated by the discovery of America brought first the Spaniards and Portuguese, then the Dutch, and finally the British upon the scene. Even before this time London had become a large emporium of trade. The reign of Elizabeth gave an impulse to Commerce, and before the 16th century had closed, the English engrossed, by an exclusive privilege, the Commerce of Russia; they explored the sea of Spitzbergen for a passage to the markets of the East; they took an active part in the trade of the Mediterranean, and they excited the jealousy of the Hanse Towns by their operations in Germany and the continent of Europe. Other English cities were now engaged in foreign trade, the merchants of Bristol doing so with the Canary Islands, and those of Plymouth with the coasts of Guinea and Brazil. The English traffic with India created the Anglo-Indian empire, and it again favorably reacted on the Commerce which had given it birth.

Commerce of the United States.—Even before the Revolutionary War the Commerce of the colonies had grown to a considerable extent, so much indeed as in some departments to excite the jealousy of the mother country and cause the enactment of stringent customs regulations, discriminating against the colonial products. For a long time after the war had ceased, the unsettled condition of Europe, while it gave an extensive market for American products, yet was a source of considerable risk and annoyance to shipping, by reason of the exposure to privateering, piracy, etc.,

which such a condition of affairs engendered. Despite these annoyances, however, American Commerce continued to increase, until the stars and stripes were familiar in every port of the earth. At the outbreak of the World War our commerce was at its height, and at the close of the war it continued to increase in volume. For the Commerce of the various countries see section *Commerce* under those countries.

COMMERCE, CHAMBERS OF. See CHAMBER OF COMMERCE.

COMMERCIAL LAW, the law which regulates commercial affairs among the merchants of different countries or among merchants generally. It is derived from the different maritime codes of mediæval Europe, the imperial code of Rome, international law, and the custom of merchants. Lord Mansfield (1704-1793) was the first great exponent of commercial law in Great Britain.

COMMINATION, the act of threatening or denouncing vengeance; a threat; also a solemn recital of God's commandments and a "Denouncing of God's anger and judgments against sinners," appointed to be used in the Church of England on Ash-Wednesday and such other times as the ordinary may direct. It was introduced at the Reformation as a substitute for the ceremony of sprinkling the head and making the sign of the cross with ashes on Ash-Wednesday.

COMMISSARY, an ecclesiastical term, an officer of a bishop who exercises spiritual jurisdiction in remote parts of a diocese, or one intrusted with the performance of the duties in the bishop's absence. Also, in the army, a term applied to officers charged with furnishing provisions, etc., for its use.

In the United States the army commissary up to 1912 was under Department of Subsistence, but in that year was joined to the Quartermaster Corps. It now falls partly in the Army Service Corps, in which body alone there are commissary officers.

COMMISSION PLAN. See MUNICIPAL GOVERNMENT.

COMMISSURE, an anatomical term applied to nervous connections between adjacent parts of the nervous system. Though it is not always used in quite the same way, the general signification of the term, and the physiological import of the structure, is that of a uniting bridge.

COMMITTEE, one or more persons elected or deputed to examine, consider and report on any matter of business.

A Committee of the whole House, a term used when a legislative body resolves itself into a committee to consider any bill or matter, in which case the speaker leaves the chair, which is taken by one of the members, called the Chairman of Committee. While in committee a member is allowed to speak more than once on any point.

The Committee of Public Safety; a rendering of the French term, *Comité de Salut public*, the name given to a committee of members of the French National Convention during the first revolution. When the National Convention, about the end of 1792, abolished monarchy and proclaimed a republic, it divided the executive government among several committees, paramount over which was the Committee of Public Safety, appointed on April 6, 1793. It was the rule of this tyrannical and sanguinary committee which is known as the Reign of Terror. Robespierre was its animating spirit, next to whom stood Couthon and St. Just. In March, 1871, the Communists established a similar committee in Paris, which fell in May of the same year.

National Committee, a body vested with control of a political party in the United States with special reference to a Presidential election.

COMMODORE, in the United States navy, formerly an officer ranking next above a captain and commanding a few ships when they were detached for any purpose from the rest of the fleet. The grade was abolished by Congress in 1899, when all commodores became rear-admirals.

The word is also a title given in courtesy to the president of a yachting club, or to the senior captain of a line of merchant vessels.

COMMODUS, LUCIUS AELIUS AURELIUS, a Roman Emperor; born in A. D. 161; the son of Marcus Aurelius. He was most carefully educated, and accompanied his father on several military expeditions. He succeeded him in 180, and, after a short period of orderly government, he dismissed his wisest counsellors, and gave himself up to the lowest society. He went so far in defiance of decency as to fight in the circus like a gladiator, and then gave himself out to be a god, and would be worshipped as Hercules. He was at last poisoned by Marcia, and then strangled by an athlete. The vices and misgovernment of Commodus hastened the fall of the empire. He died Dec. 31, 192.

COMMON COUNCIL, the council of a city or corporate town, empowered to

make by-laws for the government of the citizens.

COMMONER, in Great Britain, a term applied to all citizens except the hereditary nobility.

COMMON LAW, the unwritten law, the law that receives its binding force from immemorial usage and universal reception, in distinction from the written or statute law; sometimes from the civil or canon law; and occasionally from the *lex mercatoria*, or commercial and maritime jurisprudence. It consists of that body of rules, principles, and customs which have been received from former times, and by which courts have been guided in their judicial decisions. The evidence of this law is to be found in the reports of those decisions and the records of the courts. It is contrasted with the statute law contained in acts of Parliament; equity, which is also an accretion of judicial decisions, but formed by a new tribunal, which first appeared when the common law had reached its full growth; and the civil law inherited by modern Europe from the Roman Empire. Wherever statute law, however, runs counter to common law, the latter is entirely overruled; but common law, on the other hand, asserts its pre-eminence where equity is opposed to it.

COMMON PLEAS, in law, pleas brought by private persons against private persons, or by the government, when the cause of action is of a civil nature. In many States of the United States it is a court having jurisdiction generally in civil actions. In England the old Court of Common Pleas is now merged in the High Court of Justice.

COMMON PRAYER, BOOK OF, the public form of prayer prescribed by the Church of England to be used in all churches and chapels, and which the clergy are to use under a certain penalty. It dates from the reign of Edward VI., was published in 1549, and again with some changes in 1552. Some slight alterations were made upon it when it was adopted in the reign of Elizabeth. In the reign of James I., and finally soon after the Restoration, it underwent new revisions.

COMMONS, the people who have a right to sit or a right to vote for representatives in the English House of Commons, and all who in England are under the rank of peers without reference to their voting privileges.

English House of Commons is that one of the two Houses of the English Parliament which consists of representatives duly elected according to law in prescribed numbers by the burgh, county, and university constituencies of the United Kingdom. The name Commons is given to its members to distinguish them from the Peers of the United Kingdom who sit in the House of Lords.

History.—The earliest traces of the English House of Commons are in A. D. 1265. The year previously (on May 12, 1264), Simon de Montfort, Earl of Leicester, who was of French origin, but brother-in-law to King Henry III., defeated his sovereign at the Battle of Lewes, and made him prisoner. In 1265 the victor issued writs in the King's name requiring each sheriff of a county to return to a Parliament which he proposed to hold, two knights for the shire under his jurisdiction, two citizens for each city within its limits, and two burgesses for each borough. A Parliament of lords and other dignitaries had existed previously; county representatives may occasionally have sat almost from the commencement of the 13th century, and an assembly of knights and burgesses, nicknamed the Mad Parliament, had met in A. D. 1258, but no writs are extant before De Montfort's, summoning the representatives of cities and boroughs to attend. The Parliament thus called together met in London on Jan. 22, 1265, but on Aug. 4, De Montfort was slain at the battle of Evesham, and the royal government restored. The victory was obtained for the king mainly through the military ability of Prince Edward, afterward King Edward I., who, at least as early as 1294, *i. e.*, the 22d year of his reign, himself called together a parliament of the De Montfort type. The borough representatives were 246, those from the counties or shires 74. Under Edward III. these members had altered to 282 and 74. Each place represented sent two members, without reference to its population. There was universal suffrage; members required no property qualification, and were paid. In the eighth year of Henry VI., the county franchise was narrowed in its operation, no one now being allowed to vote unless he possessed freehold worth 40 shillings, a sum the purchasing power of which would have been about the equivalent of £12 ($60) at the beginning of the 18th century, and £20 ($100) at the beginning of the 19th. The Act 23 Henry VI. c. 14, made it an indispensable qualification for election as a member of Parliament that the person should be a knight, or eligible to be one, by which was meant that he should have a freehold of £40 ($200) a year. James I., by his royal prerogative, con-

ferred two members on the University at Oxford and the same number on that of Cambridge. All along till the revolution of 1688, efforts were made insidiously to reduce, or, if not, then at least to damage, the burgh representation. But in 1694 the 6 and 7 William and Mary, c. 2, enacted that Parliaments in future should be triennial, an alteration which much tended to render the House of Commons independent of the royal authority. A similar act had been passed in 1641, but repealed in 1664. The Act 9 Queen Anne, c. 5, established a landed property qualification for members, whether for counties or boroughs, and by the first George I., passed in 1716, the Septennial Act was established which made the legal duration of a Parliament seven instead of three years. It is still in force. At the beginning of the 18th century, England and Wales had 513 members of Parliament. The union with Scotland in 1707 added 30 county and 15 borough members to the House of Commons, that with Ireland on Jan. 1, 1801, 64 for counties, 35 for cities, and one for Dublin University. This made up the entire representation of the United Kingdom to 658, a number which was nominally preserved until 1885, though the suspension of writs in individual constituencies for proven flagrant bribery occasionally slightly reduced the number. The Act of 1885 made radical reforms, placing the basis of representation at about one member for every 9,000+ electors. The number of members for the entire realm of Great Britain and Ireland is now (1920): England and Wales, 495; Ireland, 103; Scotland, 72. In 1917 women were enrolled in the Parliamentary franchise.

Present state.—A Parliament cannot spring into life by any effort of its own; it requires to be summoned by the sovereign. During an interregnum a Convention Parliament, sometimes called simply a Convention, can do so, and has done it twice in English history, once in 1660, the other time in 1688.

The House of Commons is presided over by a Speaker. The first one, called Peter de la Mere, was elected in A. D. 1377. Most of the important legislation which emanates from the Imperial Parliament has its origin in the House of Commons. By the Septennial Act a Parliament which has escaped what may be termed a violent end dies a natural death in seven years. A general election of representatives to serve in the new House of Commons then takes place, and when a new Parliament assembles, the House of Lords, as an essential part of the complex machinery, is also summoned to meet. Few Parliaments, however, die a natural death. When the Ministry is defeated on what they deem a vital point, and they are of opinion that the country agrees with them and not with their adversaries, the sovereign generally receives and acts upon the advice to dissolve Parliament, an act which formally submits to the judgment of the constituencies the disputed point which caused the ministerial crisis.

COMMON SCHOOLS, a term used in the United States as equivalent to primary or elementary schools. The term is officially used to include public schools of the elementary grades, the first eight years of the course of study, and the secondary grade, which includes the 9th to the 12th years of course of study. Following are the principal statistics of the public school system of the United States in 1918:

Estimated population	105,253,300
Number of persons 5 to 18 years of age	27,686,476
Number of pupils enrolled	20,853,516
Per cent. of population enrolled.	26.3
Per cent. of persons 5 to 18 years enrolled	75.32
Number of pupils in average daily attendance	15,548,914
Number of male teachers	105,194
Number of female teachers	545,515
Number of school houses	276,827
Value of public school property.	$1,983,508,818
Total receipts of the year	736,876,442
Total expenditures	763,678,089
Expenditures per capita of population	7.26
Total expenditures per pupil	49.12

The system which has produced the foregoing results in the United States is now extended to Cuba, Porto Rico, Hawaii, and the Philippine Islands.

COMMONWEALTH, the state or prosperity of a country without any reference to the form of government under which it may be at the time. Owing to the semi-independent position of the States of the American Union the term commonwealth is of frequent application to the various members of the great Federal Government, which itself is spoken of as the National or Federal Commonwealth in contradistinction from its constituent autonomies. In many of the States the legal proceedings against criminals, etc., are instituted in the name of the (*e. g.*) "Commonwealth of ——— *vs.* John Doe."

The word is also applied to the period in the history of England during which the Parliamentary army and the Protector Oliver Cromwell exercised the power of government. See OLIVER CROMWELL.

COMMUNE, the unit or lowest division in the administration of France, corre-

sponding in the rural districts to the English parish or township, and in towns to the English municipality. Each commune has a council elected by universal suffrage, and the council is presided over by a *maire* and one or more *adjoints* or assistants. In the larger communes the *maire* is selected by the central government out of the members of the council; in others he is appointed by the prefect of the department. The central government through its officials exercises generally a very large control over the affairs of the commune.

The rising of the Commune of Paris in 1871 should not be confounded with COMMUNISM (*q. v.*). It was a revolutionary assertion of the autonomy of Paris, that is, of the right of self-government through its commune or municipality. The rising began on March 18, 1871, and was only suppressed 10 weeks later after long and bloody fighting between the forces of the commune and a large army of the central government; 6,500 Communists having fallen during May 20-30, and 38,578 been taken prisoners.

COMMUNION, in theology, the act of partaking with others of the sacramental symbols in the Lord's Supper. For the first three centuries the communion was administered every Lord's Day; then it became more infrequent, and before long was limited to Easter, Whitsunday, and Christmas. Many neglecting it even on these days, the Council of Lateran, in 1215, ordered all Catholics to commune at least once a year, naming Easter as the time, an injunction which the Council of Trent confirmed. For the first seven centuries the practice was somewhat general of mixing water with the wine to symbolize the mystic union between Christ and the communicant's soul. Originally both bread and wine were administered, but in 1096, Pope Urban II. sanctioned the practice of omitting the wine when the communicant was a layman. This method the Council of Constance enjoined in 1414. It has since remained in force in the Church of Rome, but at the Reformation communion in both kinds, as it is often termed, was restored to the laity.

The word applies also to the community of belief, and theoretically, at least, of Christian affection, existing among those who partake together of the Lord's Supper. From this use of the Latin word is derived the practice of calling the several denominations, Communions, as the Lutheran Communion, the Congregational Communion, etc.

COMMUNISM, a system of society in which common property is the recognized form. In later times it is an attempt to prevent or remedy the evils arising out of the inequalities of private property by holding property in common. But in primitive societies, in the hunting and pastoral stages of civilization, communism was universal. Long after the private use of land had been established, the common ownership of it by the tribe or clan was still recognized and enforced, and the arable land of the community was subject to periodical redistribution with the view to cultivation. Survivals of this system still exist in various countries of the world, notably in the Mir of the Russian empire. The Soviet Republic that succeeded in 1917 was in 1920 experimenting with communism. See COUNCIL OF WORKINGMEN AND SOLDIERS.

In the ancient world a partial communism prevailed in Crete and Sparta. During the decline of Greece more systematic speculations and experiments in communism appeared. The most eminent example of the former was the Republic of Plato. In Palestine, about the Christian era, the Essenes were a society of recluses with celibacy and the community of goods.

A most remarkable instance of community of goods is that of the early Christians at Jerusalem, recorded in Acts iv: 32. During the middle ages, sects holding the community both of goods and women appeared, like the sect of the Giovannali in Corsica.

At the Reformation the anabaptists Münzer and Bockholt set up communism in Germany, and similar notions had a wide diffusion in other countries. The most eminent literary form of it was the Utopia of Sir Thomas More (1516). Campanella's "*Civitas Solis*" (1623) has a community of goods under the despotic rule of the wise men, with a working-day of four hours.

At the discovery of America the Spanish conquerors found a system of agricultural communism under a central despotism both in Mexico and Peru. In the earliest English settlements in America, both Virginia and New England, a system of common property was attempted, but soon abandoned. During the fermentation which preceded and accompanied the French Revolution communistic ideas again emerged in the writings of Morelly and Mably.

Socialism is a vague phenomenon which must not be identified with communism. In the anarchist, as also in the Marx school to a considerable degree, socialism takes the form of a systematic

community of property, associated with vague theories of the emancipation of women.

COMNENUS, the name of a family, originally Italian, of which many members occupied the throne of the Byzantine empire from 1057 to 1204, and that of Trebizond from 1204 to 1461. See BYZANTINE EMPIRE, TREBIZOND, ALEXIUS COMNENUS. — ANNA COMNENUS, who lived in the first half of the 12th century, was a high literary as well as historical celebrity.—DAVID COMNENUS, the last representative of the imperial race in Trebizond, was executed at Adrianople in 1462, with all his family, by command of Mohammed II.

COMO, a city of Lombardy, northern Italy; at the S. W. extremity of the Lake of Como, 30 miles N. of Milan by rail. The city is surrounded by old walls flanked with towers, the gateways by which the walls are pierced being fine specimens of mediæval military architecture. Among the principal buildings of Como are the cathedral (1396-1732), and the town hall, built of marble, dating from the beginning of the 13th century. The chief articles of manufacture are silk, gloves, and soap. Como, the ancient *Comum*, was the birthplace of Cæcilius Statius, the two Plinys, of several popes, and of the physicist Volta. In 1107 it began to war with Milan, and in the course of 20 years was utterly destroyed by its antagonist. As an important headquarters of the Ghibelline party, it was rebuilt in 1158 by Frederick Barbarossa, and remained a republic for two centuries, when it fell into the hands of the Viscontis, its history since that time being bound up with that of Milan. Pop., commune, about 50,000.

COMO LAKE (anciently Lacus Larius), a lake in the N. of Italy, at the foot of the Alps; fed and drained by the river Adda, which carries its surplus waters to the Po. It extends from S. W. to N. E., 30 miles, giving off toward the middle, at the promontory where stands Bellaggio, a branch running for about 13 miles S. E. to Lecco, called the Lake of Lecco; greatest width two and a half miles, greatest depth 1929 feet. It is celebrated for the beautiful scenery of its shores.

COMORO ISLANDS, a volcanic group in the Indian Ocean, between the N. extremity of Madagascar and the continent of Africa. They are four in number: Great Comoro, Mohilla, Johanna, and Mayotta; total area, 1,050 square miles; pop. about 70,000. The people are nominally Mohammedans, and are akin to the mixed races of Zanzibar. They have large flocks and herds; and the coast lands are very fertile, abounding in tropical grains and fruits. Mayotta belonged to France since 1843, and in 1886 the others became a French possession. Since 1914 the islands have been governed by the Governor-General of Madagascar.

COMPANY, a word of various applications, including:

(1) A number of persons legally associated for the performance of any duty or the carrying on of any business. The profits are divided among the members or shareholders in proportion to the amount of capital invested.

(2) The partners in any firm whose names do not appear in the title or style of the firm; in this use the word is generally contracted to Co.

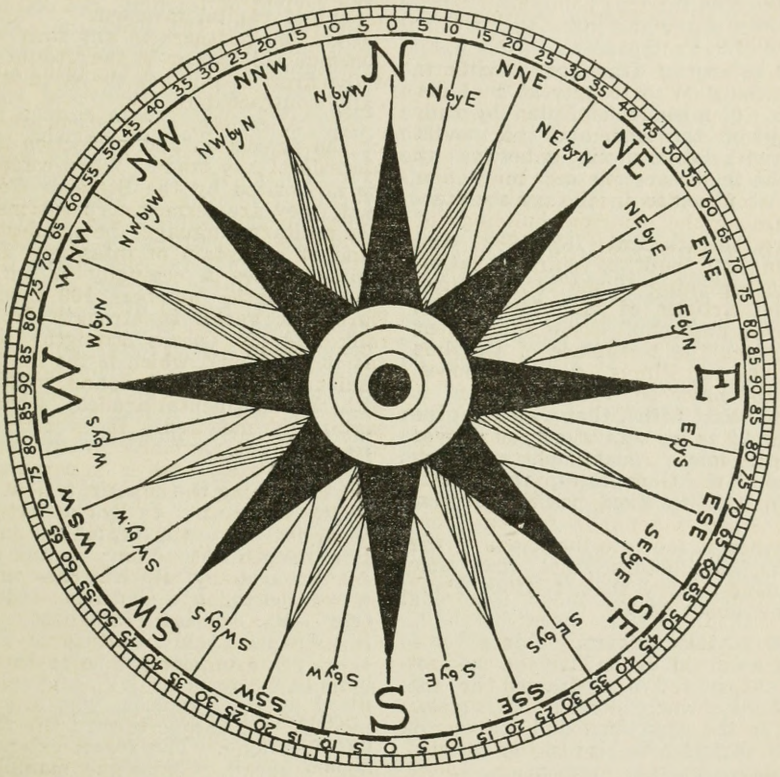
(3) A society, corporation, or guild for the promotion and protection of the interests of any trade. When companies are authorized by the State or Government, they are termed corporations.

In military language, the smallest command of a captain of infantry. In the United States a company of infantry (full strength) numbers 100 men. In Europe it varies in strength from 48 rank and file (peace strength) to 120 (as in England), which is the limit of a dismounted officer's command, to 250 (as with the Continental armies), where the captain is mounted. It is formed in three ranks in Germany, in two ranks in other countries, with a supernumerary rank containing the captain, a lieutenant, and the sergeants. In England it forms one-eighth of a war battalion, and has little independent action; on the Continent the company, which is one-fourth of the war battalion, acts almost independently. War strength (English): 3 officers (captain and 2 subalterns), 5 sergeants, 2 drummers, 5 corporals, 113 privates, 1 driver.

COMPARATIVE ANATOMY, as distinguished from special anatomy; the science which examines and compares the structure of two or more different kinds of animals, so as to discover their points of resemblance and unlikeness; and as such it is a most important department of the science of biology.

COMPASS, an instrument used to indicate the magnetic meridian or the position of objects with respect to that meridian, and employed especially on ships, and by surveyors and travelers. Its origin is unknown, but it is supposed to have been brought from China to Europe about the middle of the 13th century. As now generally used it consists of three parts: namely, the box, the card

or fly, and the needle—the latter being the really essential part, and consisting of a small magnet so suspended that it may be able to move freely in a horizontal direction. The box, which contains the card and needle, is, in the case of the common mariner's compass, a circular brass receptacle hung within a wooden one by two concentric rings called gimbals, so fixed by the cross centers to the box that the inner one, or compass-box, shall retain a horizontal position in all motions of the ship. The circular card is divided into 32 equal parts by lines drawn from the center bar of magnetized steel. It is fixed on the under side of the card, and in the center is placed a conical socket, which is poised on an upright pointed pin fixed in the bottom of the box; so that the card, hanging on the pin, turns freely round its center, and one of the points, by the property of the needle, will always be directed toward the North Pole. The needle, however, is liable to a certain deviation owing to the magnetism of the ship itself, and this is especially strong in iron ships. To obviate this defect Sir William Thomson invented a compass, having a number of needles arranged in



COMPASS

to the circumference, called points or rhumbs; the intervals between the points are also divided into halves and quarters, and the whole circumference into equal parts or degrees, 360 of which complete the circle; and consequently, the distance or angle comprehended between any two rhumbs is equal to 11¼°.

The four principal are called cardinal points: viz., North, South, East and West. The names of the rest are compounded of these. The needle is a small a particular manner instead of one. In this compass quadrantal errors are corrected by means of two iron globes fixed on opposite sides of the binnacle; while the various components of the ship's magnetic force are neutralized by a series of bar-magnets so arranged as to act as correctors. In the compass used by land-surveyors and others the needle is not fixed to the card, but plays alone, the card being drawn on the bottom of the box.

COMPASSES, a mathematical instrument used by describing circles, measuring lines, etc. They consist simply of two pointed legs movable on a point or pivot. For describing circles the lower end of one of the legs is removed and its place supplied by a holder for a pencil or pen.—*Hair Compasses* are compasses having a spring tending to keep the legs apart, and a finely-threaded screw by which the spring can be compressed or relaxed with the utmost nicety, and the distance of the legs regulated to a hair's breadth.—*Bow Compasses* are compasses having the two legs united by a bow passing through one of them, the distance between the legs being adjusted by means of a screw and nut.—*Proportional Compasses* are compasses used for reducing or enlarging drawings, having the legs crossing so as to present a pair on each side of a common pivot. By means of a slit in the legs, and the movable pivot, the relative distinces between the points at the respective ends may be adjusted at pleasure in the required proportion.

COMPASS PLANT (*Silphium laciniatum*), a plant of the order *Compositæ*, It is called compass-plant because it is said that it presents the edges of its leaves N. and S., while their faces are turned E. and W. It grows freely on our western prairies.

COMPENSATION, that which is given or received as an equivalent for services rendered, losses sustained, sufferings endured, or in payment of a debt; amends, remuneration, payment, recompense.

COMPENSATION BALANCE, a balance-wheel for a watch or chronometer, so constructed as to make isochronal (equal time) beats, notwithstanding changes of temperature. This effect is usually attained by having the balance-wheel cut into two segments, the arcs being fixed at one end each. This allows space for the expansion and contraction with no variation in size of the wheel.

COMPENSATION PENDULUM, a pendulum constructed of two different metals, as brass and iron, which so work against each other, that the expansion of the one downward is counteracted by that of the other upward. By this arrangement the pendulum does not vary in length, and consequently in frequency of vibration, whatever the temperature may be.

COMPETITION, the act of endeavoring to gain what another endeavors to gain at the same time. In political economy it is simply the form taken by the struggle for existence as applied to industry. Formerly, prices and generally the economic relations of men to each other were regulated by custom or authority. The growth of freedom has now brought it about that these relations are determined by individual effort. In mediæval times the relations of men were fixed by custom or authority. But the restraints of custom and authority were felt to be vexatious, oppressive, and injurious, and in the various spheres of human activity, in religion, politics, and economics, the free individuality of men sought and found wider room to develop itself. This great movement began with the revival of learning, the discovery of America, and the Protestant Reformation and has been continued through the revolutions of the 17th, 18th, and 19th centuries. In the industrial sphere it means that whereas in former times a man's calling, place of residence, and the remuneration of his industry were fixed for him, he is now at liberty to decide them for himself as best he can. The English trades-unions are an attempt to regulate competition in the interest of labor. Employers' combinations have a like object in the interests of the capitalist. In the United States especially the development of "trusts" tends to make competition a dead letter, but recent legislation has curbed their power. The protective systems of France, Germany, and the United States are intended to maintain native industries against British competition.

COMPIÈGNE (kōmp-yān'), a picturesque town in the French department of Oise, on the Oise river, a little below its junction with the Aisne, 52 miles N. N. E. of Paris. Of its churches three deserve notice, St. Germain (15th century), St. Antoine (12th century), and St. Jacques (13th century). But the chief pride of Compiègne is its palace, built anew by Louis XV., and splendidly fitted up by Napoleon, who often occupied it. Its façade toward the forest is 624 feet long. The forest extends over 30,000 acres. Compiègne manufactures canvas, cordage, and sugar. Compiègne is mentioned in the times of Clovis under the name of *Compendium*. It was at the siege of this town, in 1430, that the Maid of Orleans was captured; and here, in 1810, Napoleon first met Maria Louisa of Austria, on occasion of their marriage. The town was captured by the Germans in 1914, and suffered heavily during the battles of the Marne and Aisne. The French later captured the place, but almost lost it in the great German drive in June, 1918. Pop. about 18,000.

COMPLEMENT, of an angle, what it lacks to make up 90°; of an arc, to make up a quadrant; and hence, in astronomy, the complement of a star is its zenith-distance. In music, two intervals, which together make up an octave, are called complementary. In arithmetic, if any number is subtracted from the next higher power of 10, the result is its complement. Thus 7 and 3 are complementary; so are 63 and 37; 881 and 119; and 1.4384386 is the complement to 8.5615614. In chromatics, red is the complement of green, orange of blue, and yellow of violet.

COMPLEXION, a word formerly applied to the temperament, and natural disposition of the body.

The human skin was supposed to consist of only two parts—the *cuticle*, or epidermis, and the *cutis*, or real skin; but Malpighi showed that between these two was a soft gelatinous cellular texture, which he distinguished by the title *rete mucosum*. On this discovery that anatomist offered a suggestion as to the color of negroes. The *rete mucosum* is of very different color in different nations; and the difference of its color corresponds so exactly with the difference of their complexions, that there can be little doubt that it is the principal seat of the color of the human complexion.

COMPLINE, the last of the daily canonical hours in the Roman Catholic breviary; the complement of the Vespers or evening office.

COMPOSITÆ, an order of plants, founded in 1751 by Linnæus, and adopted in 1763 by Adanson. It contains many plants separated from others by characters so obvious that it still stands with essentially the same limits as those assigned it in the infancy of botany. Lindley altered the name of the order to *Asteraceæ*. De Candolle, Lindley, etc., divided it thus—Sub-order 1, *Tubulifloræ:* Tribe (1) *Vernoniaceæ*, (2) *Eupatoriaceæ*, (3) *Asterioideæ*, (4) *Senecioideæ*, (5) *Cynareæ*. Sub-order 2, *Labiatifloræ:* Tribe (1) *Mutisiaceæ*, (2) *Nassauviaceæ*. Sub-order 3, *Ligulifloræ:* Tribe *Cichoraceæ*. The eight tribes now mentioned were first properly discriminated by Lessing, who showed that each had a different stigma.

COMPOSITE ORDER, a term denoting the last of the first orders of architecture. As its name implies, it is composed of two orders, the Corinthian, and the Ionic. In detail, the Composite is richer than the Corinthian, but it is less light and delicate in its proportions. Its architecture has only two faciæ, and the cornice varies from the Corinthian in having double modillions. The column is 10 diameters high. The principal ancient examples of this order are the temple of Bacchus at Rome, the arch of Septimius Severus, that of Titus, and the baths of Diocletian.

COMPOSITION, an arrangement which a bankrupt or person in pecuniary difficulties makes with his creditors, and by which he arranges to pay them a certain proportion only of the debts due.

COMPOSTS, in agriculture, are mixtures of various fertilizing substances.

COMPOUND ANIMAL, an animal which, originally simple, develops into a few or many others, which retain physical connection with the parent instead of being sooner or later detached in the normal way.

COMPOUND FRACTURE, a fracture in which the bone is broken and the surrounding integuments have been pierced, making a wound from the external surface to the seat of the fracture.

COMPOUNDING OF FELONY, the accepting of a consideration for forbearing to prosecute; or the agreeing to receive one's goods again from a thief on condition of not prosecuting. This is an offense punishable by fine and imprisonment.

COMPOUND SPIRITS, rectified spirits to which has been added one or more flavoring ingredients. They are called also compounds. The chief compounds are gin, British rum, British brandy, and some grades of American whisky, cordials and liquors.

COMPOUND STEAM-ENGINE, a form of steam-engine originally patented by Hornblower in 1781, in which steam at a relatively greater pressure was allowed to expand in a small cylinder, and then escaping into a larger cylinder, to expand itself against a larger piston. Compound engines are of two classes, which may be called compound and independent compound engines. The former are those in which the cylinders are near each other, and the pistons commence their respective strokes simultaneously or nearly so, the steam expanding from one cylinder direct to the other through as small a passage as convenient. To this class belong most land engines, and the compound marine with cranks at about 130°.

COMPRESSED AIR, atmospheric air compressed by means of pumps, etc., and used in driving stationary and locomotive engines and excavating machines; as also in working pneumatic dispatch-

tubes, railway-brakes, etc. The use of compressed air by railroads began with the introduction of the Westinghouse air brake on passenger trains, about 1869. See AIR BRAKE.

A few years later the Denver, and Rio Grande, the Union Pacific, and the Central Pacific railroads began equipping freight cars with the air brake. For some time sleeping cars have used compressed air to force water from a tank under the car to the wash bowls in the toilet rooms. The train signal is operated by compressed air; pulling the bell cord in any of the cars blows a small whistle in the locomotive cab. Automatic bell ringers on the locomotives are run by compressed air. It has also been applied to shake the grates in the fire-box of a locomotive, and to open and close the furnace door.

For some years railroad crossing gates have been raised and lowered by it, the air being supplied by a hand pump operated by the crossing watchman.

In 1891 its first application to car work was in cleaning the dust from the window sashes and blinds in coaches, and such parts of the inside that a duster could not reach. A round nozzle with a small opening was first used. This led to the use of a flat nozzle about two inches wide for cleaning cushions, seat backs, carpets, blankets and bedding. The sleeping car companies recognized its superiority for cleaning cars, and are using it very extensively. As its value in shops began to be appreciated, and the demand made by increased use exceeded that which air pumps could supply without an extravagant waste of fuel, air compressors were added to give an increased supply of air. This opened a new field for the use of compressed air. Pneumatic hoists began to replace chain hoists at all the heavy machines in the shops, driving wheel lathes were equipped to handle drivers in and out of the lathe, cranes were located in the yards for loading and unloading material, and in each instance a large saving of labor and time was effected.

The introduction of compressed air in shop practice has brought out by the shops themselves and by tool manufacturers a number of very useful and valuable tools—pneumatic drills, hammers, riveters, punches, and machines especially designed for boiler work. The pneumatic drill performs a very important part in the construction of new or the repair of old boilers. It has displaced the flexible shaft, and is now considered an indispensable tool for fastening the flues in a locomotive boiler. Air can be led to and run a number of machines where light power is required. The pneumatic hammer is used for chipping and caulking the seams of a boiler, beading over the ends of flues, chipping castings and driving rivets. The pneumatic riveter is made either stationary or portable, and for all varieties of work, such as riveting locomotive boilers or locomotive tanks. Portable riveters are used for riveting locomotive mud rings, or car and tender trucks. Jacks for raising passenger and freight cars, and raising locomotives; machines for pulling down draft timbers from the car sills; shears for cutting off bolts, hammers for straightening bolts (the latter machine is usually located at the scrap pile); the sand blast for taking old paint from locomotive tanks; a machine for sandpapering the outside surface of a passenger car.

Aside from the number of useful tools compressed air has brought into service, it has been used in a number of ways in place of hand and steam power. A whitewashing machine run by air does better work than a man with a brush, and can do as much work in 10 hours as 30 men can do. It is also used for painting buildings and freight cars. Compressed air is also used in connection with gas for burning paint off coaches. It is sometimes introduced into a barrel or a tank through a coil of gas pipe, for the purpose of mixing paint. It is used for kindling fires in locomotives with oil fuel; elevating oil from tanks; elevating water; running transfer tables; copying letters; blowing out the steam passages in locomotive cylinders. It may be said the use of compressed air on railways will in the near future perform a large share of the work done by hand labor and steam.

In 1893, John Wanamaker, as Postmaster-General, opened the first pneumatic mail-tube line, extending from the postoffice to the house in Philadelphia. Pneumatic mail tube lines are in operation in most all large American cities.

COMPRESSED AIR ENGINE, an engine which is actuated by air under pressure, which air has been compressed by mechanical means. Air under pressure is able to act as a piston of an engine in the same manner as steam, and an ordinary steam engine is capable of being operated by compressed air by merely changing a few connections. The average compressed air engine is small in size, and usually designed for some special use, and is generally located in some distance from the source of power, or in place where the discharge of exhaust steam would be objectionable, as in a mine. Air under pressure can be

more easily transported a distance than can steam, which loses some of its power through condensation.

COMPRESSED AIR LOCOMOTIVE, a locomotive in which the power is furnished by air under pressure. These locomotives resemble a steam locomotive, except that in place of the steam generating apparatus they carry tanks of air under pressure, which tanks have to be recharged at a pumping station. The principal use is in chemical works, explosive plants, textile works, mines, lumber mills, cotton presses; in fact, anywhere that every precaution against fire has to be taken.

The mining locomotive may be taken as a typical example of a compressed air locomotive. The air is carried in one or two steel tanks, the capacity of which is determined by the use: load, length of haul, etc., which is to be made of the locomotive. These tanks are placed in the same position that the boiler would occupy on a steam locomotive, and the air is conducted to an auxiliary tank, the pressure in which can be controlled, from which tank it is conducted to the engine cylinders. The flow of the air is controlled by a reducing and a stop valve.

For a number of years an attempt was made to operate street railway motor cars with air. In New York City several cross-town lines were equipped with cars carrying tanks under the floor of the car or under the seats.

In most cases modern engineering uses some form of electric vehicle such as the storage battery locomotive, in place of the compressed air locomotive.

COMPRESSED AIR TREATMENT, a system of treatment in which use is made of air under pressure. The treatment is used for tuberculosis, and in some forms for asthma and chronic bronchitis. There are two main methods of administering the treatment. In the first the patient is placed in an air-tight chamber, and the pressure of the air is increased. In this case the pressure on all parts of the body is the same, and is said to cause increased absorption of oxygen. In the second method, the patient is placed in a cabinet, a tube which he places in his mouth being the only connection with the outside air, and the air pressure in the cabinet is reduced; thus the pressure on the lungs is greater than on any other part of the body, which may relieve collapse of the pulmonary vesicles.

COMPTOMETER, a calculating machine that is operated by a key-board in the manner of a typewriter. It consists of a box entirely inclosing the mechanism, with the operating keys projecting from the box in typewriter fashion. Along the front edge of the box are openings in which numbers appear, and above these openings are pointers. The keys are 72 in number, and each has two figures painted on it. One is a large black figure and the other a small red one. The black ones indicate the keys that are to be struck in addition and multiplication, and the red ones those to be struck in division and subtraction. The successful operation of the machine depends upon the practice of the operator in the same manner that efficiency of the typewriter depends upon the amount of practice that the operator has had. No proficiency in mathematics is required on the part of the operator; anyone skilled in handling the keys can rattle away at the comptometer as confidently as if he were writing letters on a typewriter, and all the time be adding up large sums or dividing millions by thousands without any of the laborious thinking usually required of the mathematician, the bookkeeper and the accountant.

COMPULSORY MILITARY SERVICE. See MILITARY ORGANIZATION, UNITED STATES.

COMSTOCK, GEORGE CARY, an American astronomer, born in Madison, Wisc., in 1855. He graduated from the University of Michigan in 1877. After studying law he was admitted to the bar, but never engaged in active practice. He was assistant engineer of the United States Lake Survey from 1874 to 1878. He was later assistant engineer on the improvement of the Mississippi river; assistant astronomer at the Washburn Observatory; and computer in the Nautical Almanac Office. From 1885 to 1887 he was professor of mathematics and astronomy at the Ohio State University. From the latter year he was full professor and director of the Washburn Observatory. In 1906 he was created dean of the Graduate School of the University of Wisconsin. He was a member of many learned societies. His writings include "Method of Least Squares" (1890); "Text-Book of Astronomy" (1900); "Field Astronomy for Engineers" (1902); and "The Summer Line as an Aid to Navigation" (1919).

COMSTOCK LODE, a large and extremely rich metallic lode in the W. part of Nevada, on the E. slope of the Virginia Mountains. To it belong the Big Bonanza and other mines, which have yielded gold and silver to the value of over $300,000,000.

COMTE, AUGUSTE (kônt), a noted French philosopher, founder of the Positive Philosophy; born in Montpellier, Jan. 19, 1798. On leaving college he became acquainted with Saint-Simon, and joined the band of brilliant disciples that distinguished social reformer had gathered around him. On the death of its founder, in 1825, Comte deserted the Saint-Simonian school to found one of his own; and during the next 20 years devoted himself to the elaboration of an original system of scientific thought—Positive Philosophy. In his view the problem for philosophy is to ascertain the positive and verifiable basis of all knowledge, science, and religion—of the whole intellectual, moral, and religious world of man. In working out this problem Comte studied the basis of the State or civil society and set forth his conclusions in "The Positive Polity." He bases the law of morals or of conduct on the "social feeling" or altruism. The central fact of religion and the one object of religious worship is Humanity conceived as a personality. He contemplated the constitution of a priesthood whose authority was to have as wide a reach as the authority of the popes in mediæval times. His "Positive Philosophy," "Positivist Catechism," and "Positive Polity," have been translated into English. He died in Paris, Sept. 5, 1857.

COMUS, in later Greek mythology, a divinity of festive mirth, represented as a winged youth, sometimes drunk and languid as after a debauch, or slumbering in a standing posture with legs crossed. Comus thus becomes the representative deity of riotous merry-making, of tipsy dance and jollity.

CONATY, THOMAS JAMES, an American clergyman; born in Ireland, Aug. 1, 1847. He was graduated at Montreal Theological School and ordained a Roman Catholic priest in 1872, and from 1880 to 1897 was pastor of the Church of the Sacred Heart and from 1893 to 1897 president of the Catholic Summer School. In 1896 he was made rector of the Catholic University of America, in Washington, D. C., and on Nov. 24, 1901, he was consecrated titular bishop of Samos. He became bishop of Monterey and Los Angeles, 1903. He was author of "New Testament Studies," etc. He died on Sept. 18, 1915.

CONCENTRATION CAMPS, or DISTRICTS, the terms are in military usage applied to points, contiguous to the scene of intended departure or operations, where troops are appointed to assemble in large force. The object may be an immediate attack on the enemy or embarkation for the front. During the World War the terms were also applied to the improvised places where war prisoners were confined, and at an earlier date to the camps in which the British collected Boer non-combatants during the war in South Africa (1899-1902). This is the sense in which the term is popularly used, and it was given a wider application during the rebellion in Cuba against Spanish rule (1896-1898) when the commanders of the Spanish forces compelled Cuban women and children and other non-combatants to remain within certain fixed boundaries. The idea has been put into practice in most modern campaigns, and concentration camps or districts, where non-combatants were kept out of danger and prevented from interfering with military operations, were established by the American forces in the Philippines during the war with Spain.

CONCEPCION, the name of several places in Spanish America, including (1) a province of Chile stretching from the Andes to the coast N. of Arauco. It is an important agricultural and cattle-raising district; and has valuable coal-mines. Area, 3,535 square miles; pop. about 225,000. Concepcion, the capital, near the mouth of the Biobio, has a cathedral and notable buildings. Its port is the safest in Chile. It ranks next to Valparaiso as a mart of foreign trade. Pop. about 55,000. (2) Concepcion del Uruguay, the former capital of the Argentine province of Entre Rios, on the Uruguay, 180 miles S. E. of Paraná by the Entre Rios railway, with large slaughter-houses and active river-trade. (3) Concepcion, a town of Paraguay, on the Paraguay river, about 260 miles above Asuncion, with trade in *maté*. (4) The name of several places in Bolivia, the largest being Concepcion de Apolobamba, capital of the province of Caupolican, formerly a Franciscan mission. Its Indian population cultivate coca and cacao, and collect medicinal barks from the surrounding forests. (5) Concepcion, a town of Mexico, 50 miles W. of Chihuahua, in the upper Yaqui valley, famous for its apples. (6) Concepcion de la Vega, a town of San Domingo, 5 miles S. E. of Santiago.

CONCEPTION, in physiology, the first formation of the embryo of an animal; the first animation of the ovum at the moment when it escapes from the ovarium, passing through the Fallopian tube to the uterus.

In mental philosophy:

(1) The cognition of classes, as distinguished from individuals; that special

application of abstraction, comparison, and attention which elaborates what logicians call notions or concepts; the acts of the mind in producing concepts or notions.

(2) The notions or concepts so produced; the "general" or "abstract ideas" of Locke; the "abstract general notions" of Hamilton. These are properly expressed by common terms, and constitute the object of study in pure or formal logic. The number of attributes embraced in a concept or notion constitutes its intention, comprehension, or logical content, and this determines its area or sphere of applicability, that is, its extension or logical extent. These two quantities exist in an inverse ratio to one another. The maximum of the extent of a conception or notion is the minimum of the content, and the maximum of the content is the minimum of the extent. On this single maxim pure or formal logic has been based.

CONCEPTION, IMMACULATE, in the Roman Catholic Church, the doctrine that the Virgin Mary was born without the stain of original sin. This doctrine came into favor in the 12th century, when, however, it was opposed by St. Bernard, and it afterward became a subject of vehement controversy between the Scotists, who supported, and the Thomists, who opposed it. In 1708 Clement XI. appointed a festival to be celebrated throughout the Church in honor of the immaculate conception. Since that time it was received in the Roman Church as an opinion, but not as an article of faith till 1854, when the Pope issued a bull which makes the immaculate conception a point of faith.

CONCEPTION OF OUR LADY, an order of nuns, founded in Portugal in 1484 by Beatrix de Sylva, in honor of the immaculate conception. It was confirmed in 1489 by Pope Innocent VIII. In 1489 Cardinal Ximenes put the nuns under the direction of the Franciscans, and imposed on them the rule of St. Clara. The order subsequently spread into Italy and France.

CONCEPTUALISM, the distinctive speculative opinion, or opinions, of the conceptualists.

CONCERTINA, a musical instrument invented by Professor Wheatstone, the principle of which is similar to that of the accordion. It is composed of a bellows, with two faces or ends, generally polygonal in shape, on which are placed the various stops or studs, by the action of which air is admitted to the free metallic reeds which produce the sounds. In the English concertina the compass is three octaves and three notes.

CONCERTO, a composition for the display of the qualities of some especial instrument, accompanied by others of a similar or dissimilar character. The word is at the present time usually applied to a composition for a solo instrument accompanied by full orchestra, as opposed to a sonata, in which the soloist is unaccompanied by other instruments, or only supported by the pianoforte.

CONCH, a marine shell, especially of the Strombus gigas; and, in art, a spiral shell used by the Tritons as a trumpet, and still used by some African people in war. The shells are found in large numbers in West Indies, in Florida, and in Bahamas. The conches are shipped generally to Europe and used for medical purposes, ornaments, etc.

CONCHA, JOSÉ GUTIERREZ DE LA, a Spanish soldier and statesman, born in Cordoba, Argentina, in 1809. He served in the Spanish army and was appointed captain-general of Cuba. In 1862 was made a minister to France, and between 1864-68 served as president in the Spanish senate. He died in 1895.

CONCHA, MANUEL GUTIERREZ DE LA, a Spanish general, brother of José Concha, born in 1808. In 1845 he put down an uprising in Catalonia, and in 1847 amicably adjusted a dispute between Portugal and Spain. In the revolution of 1868 he vainly aided the cause of the Bourbons and was forced to flee from Spain. He was killed in 1874 while assaulting a fortress at Estella.

CONCHOID, a curve invented by Nicomedes in the 2d century A. D., and used by him for finding two mean proportionals.

CONCHOLOGY, the science of shells. Two well-marked stages in its development are traceable. At first shells were studied without any reference to the animals of which they constituted the hard framework or sekelton. Subsequently the study took a wider scope, and for the first time became worthy of being called a science, when the animals and their shells were viewed as parts of one common whole.

When shells, and they alone, were studied, conchology was a not unsuitable name, except that the termination -ology suggested that the investigation was more scientific than in most cases it really was. When the animals came to be carefully examined, M. de Blainville proposed for this deeper study the name malacozoölogy—*i. e.*, the study of the

softer animals—viz., mollusks; this has been since abbreviated into malacology.

CONCINI, CONCINO, an Italian, minister to Louis XIII.

CONCLAVE, the place where the cardinals assemble for the election of the Pope; also the electoral assembly of the cardinals themselves. Pope Gregory X., whose election had been delayed for three years, established in the council at Lyons (1274) the regulations of the conclave. The cardinals are shut up together in a particular suite of apartments in the palace where the pontiff dies, and they are supposed to have no communication with the outside world during the period of the election. The companion, either lay or clerical, whom the cardinal is allowed to take with him into the conclave during the election of a Pope is called a conclavist. The office is one of great delicacy and trust.

CONCORD, in music, the combination of two or more sounds pleasing to the ear. Concords are the octave, the fifth, third, and sixth. The two first are called perfect, because as concords they are not liable to any alteration by sharps or flats. The two last are called imperfect, as being alterable.

CONCORD, a town of Middlesex co., Mass.; on the Concord river and the Boston and Maine railroad; 20 miles W. of Boston. It is situated in a beautiful rural district, and has several manufacturing establishments. It was for many years the seat of the famous Concord School of Philosophy, and is the site of the Concord State Reformatory. It has a public library, high school, a National bank, and an assessed property valuation of $4,000,000. During the early part of the Revolution the Americans had a large stock of arms and military stores at Concord. Gen. Gage, the British Commander in Boston, hearing of this, sent a body of soldiers to destroy these stores, and on their way they fought the battle of Lexington, the first of the war. When they reached Concord they destroyed what stores they could find, but were soon driven off by the Americans (April 19, 1775). Concord is celebrated as the home of many famous writers, among them Emerson, Hawthorne, Thoreau, and Miss Alcott. Pop. (1910) 6,421; (1920) 6,461.

CONCORD, a city, capital of the State of New Hampshire, and county-seat of Merrimac county; on the Merrimac river and several branches of the Boston and Maine railroad; 75 miles N. W. of Boston.

Concord has an abundance of water power supplied by near-by streams, and extensive manufactories of carriages, shoes, twine, electrical apparatus, silverware, leather goods, machine shop products, etc. Near the city are extensive quarries of a fine-grained white granite. There are three National banks and several private banking houses.

Public Interests.—The city is well laid out with finely shaded streets, is lighted by gas and electricity, and has an extensive waterworks plant. The noteworthy buildings include the State Capitol, a fine building of Concord granite, the City Hall and Court House, the State Prison, State Insane Asylum, and the United States Government buildings. There is an excellent system of public schools, and several private schools, including St. Paul's School for boys.

History.—Concord was settled by the whites in 1725, on the site of an Indian village, but till 1765 it was called Rumford. It became a city in 1853. It is noted as the place where Hannah Dustin, another woman, and a boy, who had been taken captive by Indians at Haverhill, Mass., killed the 10 Indians, when asleep, with hatchets, and so escaped. Pop. (1910) 21,497; (1920) 22,167.

CONCORD, a city of North Carolina, the county-seat of Cabarrus co. It is on the Southern railroad. There are manufactures of cotton, foundries, and machine shop. The city is the seat of the Jackson Training School and the Scotia Seminary. Pop. (1910) 8,715; (1920) 9,903.

CONCORDANCE, a book of reference in which all the words existing in a particular version of the Bible are arranged alphabetically — part of the verse being extracted with each, so that if one remember a notable word in any part of the Bible he may find, with scarcely any expenditure of time, where it occurs. A similar work may be constructed to enable students to find where each Hebrew word occurs in the Old Testament, or each Greek one in the New Testament or in the Septuagint. The first known Concordance of the Bible in any language was that of St. Anthony of Padua, who was born in 1195, and died in 1231. His work was called "*Concordantiæ Morales*," and was of the Latin Vulgate. The first Hebrew Concordance was that of Rabbi Isaac Nathan, commenced in 1438 and finished in 1448. The first Greek Concordance to the New Testament was that of Xystus Betuleius, whose real name was Birck; it came forth in A. D. 1546. The first English Concordance to the New

Testament was that of Thomas Gybson, before A. D. 1540; the first to the whole English version of the Bible that of Marbeck, A. D. 1550. These, of course, preceded the appearance in A. D. 1611 of the authorized version of the Bible. The elaborate and well-known work of Cruden appeared first in 1737.

The first known Concordance to Shakespeare was that of Ayscough, in 1790. Mrs. Cowden Clarke's elaborate and most useful work first appeared in 1847. Concordances to Milton, Thompson, and other celebrated poets and authors have been published.

CONCORDAT, a compact, a convention, or an agreement entered into between the Pope and a sovereign prince or a government for regulating the affairs of the Church within the kingdom. A Concordat between Pope Calixtus II. and the Emperor Henry V. of Germany was agreed on in 1122, which terminated the fierce controversy about investitures, and still to a certain extent regulates the affairs of the Roman Catholic Church in Germany. In 1516 a Concordat took place between Pope Leo X. and Francis I., King of France, by which the Chapters were deprived of the right which they had formerly enjoyed of electing the bishops of the several sees. After much delay and royal importunity the French Parliament reluctantly registered this surrender of privilege on March 15, 1518. Omitting less interesting Concordats, a celebrated one took place on July 15, 1801, between Pope Pius VII., acting through Cardinal Consalvi, and Napoleon Bonaparte, then first consul. This engagement re-established the Papal authority in France, but placed the clergy, in temporal and in some spiritual matters, under the jurisdiction of the civil power. Other concordats with the French Government were on Jan. 25, 1813, and Nov. 22, 1817. On Aug. 18, 1835, a Concordat concluded between Pope Pius IX. and the Emperor Francis Joseph I. of Austria considerably increased the legal power of the Papacy in that empire; it was virtually abolished in 1868.

CONCORDIA, a goddess, to whom many temples were built at Rome; she typified the good results of the compact between the patricians and the plebeian classes.

CONCORDIA, a town of the Argentine state of Entre Rios, on the Uruguay, 302 miles N. of Buenos Aires by river. It has a custom house and a river-trade exceeded only by that of Buenos Aires and Rosario, exporting salted meat and Paraguay tea. Pop. about 13,000.

CONCRETE, a technical term in logic, applied to an object as it exists in nature, invested with all its attributes, or to the notion of such an object. Concrete is opposite to abstract. The names of individuals are concrete; those of classes, abstract. A concrete name is a name which stands for a thing; an abstract name is a name which stands for the attribute of a thing.

CONCRETE, a composition used in building, consisting of hydraulic or other mortar mixed with gravel or stone chippings about the size of a nut. It is used extensively in building under water, for example, to form the bottom of a canal or sluice, or the foundation of any structure raised in the sea; and it is also frequently used to make a bed for asphalt pavement, or to form foundations for buildings of any kind. It is used as the material with which the walls of houses are built, the concrete being run into moulds of the requisite shape, and then allowed to set. It is generally re-enforced with steel wire to strengthen it especially in open wall building. See CEMENT.

CONCRETIONARY STRUCTURE, a condition in rocks produced by molecular aggregation subsequent to the deposition of the strata, whereby the material of the rock is formed into spherules or balls, as in the concretions of magnesian limestone and the somewhat similar structures occasionally seen in certain tuffs and crystalline igneous rocks. Concretions are nodules, balls, or irregular masses of various kinds which occur scattered through the body of a rock, and consist of mineral matter which was formerly diffused through the material of the rock.

CONCUBINAGE, the act or state of living with one of the opposite sex without being legally married. Concubinage was tolerated among the patriarchs (Gen. xxv: 6) and by the Mosaic law (Exod. xxi: 9-12; Deut. xx: 14), and was largely practiced by Solomon (I Kings xi: 3). It was tolerated also among most if not all other Oriental nations, as well as among the Greeks and the Romans to the time of Constantine. The laws of the various States of the United States generally sanction only proper marriage; but on the Continent of Europe morganatic or left-handed marriages sometimes contracted by royal personages are essentially the same as the concubinage of the old Romans.

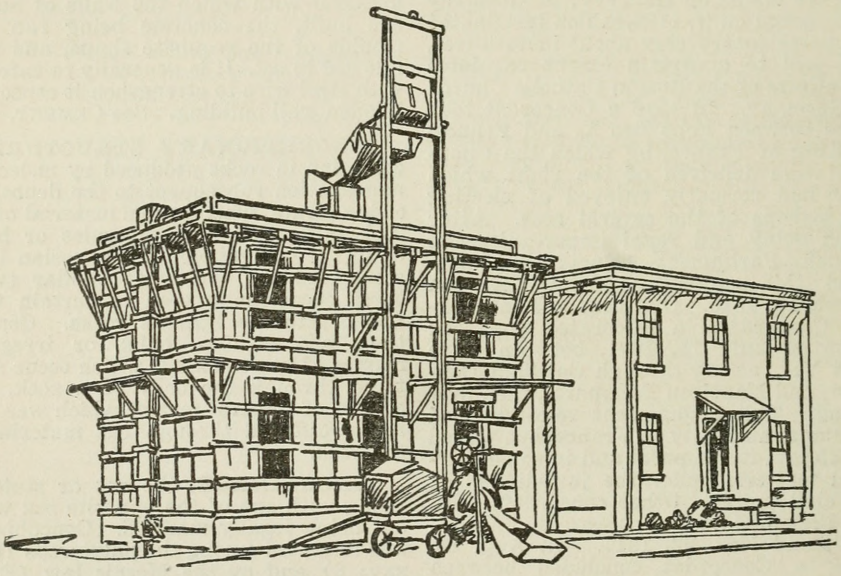
CONDÉ (kôn-dā'), the name of a French family, the younger branch of the Bourbons, who took their name from the town of Condé, department of

Nord. One Godfrey de Condé, about 1200, was in possession of a part of the barony of Condé. His great-granddaughter, Jeanne de Condé, married in 1335, Jacques de Bourbon, Comte de la Marche, and the barony of Condé went to their second son, Louis de Bourbon, Comte de Vendôme, whose great-grandson, Louis de Bourbon, Prince of Condé, in virtue of his blood-relationship to the royal family, assumed the title of Prince, and is regarded as the founder of the new house of this name. Its more celebrated members in history are the following:

CONDÉ, LOUIS I. DE BOURBON, PRINCE DE, son of Charles, Duke of Vendôme; born in 1530. He married the grandniece of the Constable de Montmorenci. He served his early campaigns in Piedmont, but first distinguished himself at the defense of Metz, besieged by Charles V. in 1552. Affronted at court, and hated by the Guises, he joined his brother, the King of Navarre, at Nérac, and became a Protestant. In 1560 he was arrested and sentenced to death, but was discharged after the death of Francis II. He soon after appeared as head of the Protestants, and was defeated and captured at the battle of Dreux. He was again wronged by being refused the office of lieutenant-general of the kingdom, to which he was entitled. In 1567 he fought the battle of St. Denis. Two years later the Protestants were defeated, and Condé was slain at Jarnac.

CONDÉ, HENRI II., PRINCE DE, who at the request of Henry IV. became a Catholic; born in 1588. In 1616 he was sent to the Bastille, where he remained for three years. After the death of Louis XIII. the prince was liberated, and was made Minister of State to the regent. He died in 1646.

CONDÉ, LOUIS II. DE BOURBON, PRINCE DE, called THE GREAT, son of the preceding; born in Paris in 1621. He married a niece of Cardinal Richelieu, and was at first known as the Duc d'Enghien. His first great achievement was the victory over the Spanish army at Rocroi, in 1643. The capture of Thionville soon followed. The following year was marked by the battle of Freiburg, which lasted three days, and the great victory over the Imperialists at Nördlingen. After taking Dunkirk, in 1646, Condé was, through envy, sent to Catalonia, where with poor troops success failed him. It was necessary soon to recall him to Flanders, where he won the victory of Lens over the Archduke Leopold, in 1648. Having offended the first minister, Cardinal Mazarin, he was imprisoned for more than a year, and after his liberation he led the army of the Frondé, began the siege of Paris, and encountered Turenne and the royalists in the Faubourg St. Antoine. Soon after he entered the service of Spain, and contended with varying success against his countrymen in Flanders. After the Peace of the Pyrenees he returned to Paris, and was employed in the conquest



BUILDING A CONCRETE HOUSE

of Franche-Comté. In the war with Holland, in 1672, he was wounded for the only time. His last great exploit was his victory over William, Prince of Orange (William III.), at Senef, in 1674. A martyr to the gout, he retired in the following year to Chantilly. He died in 1686.

CONDÉ, LOUIS JOSEPH, PRINCE DE, born in Paris in 1736, was brought up by his uncle, the Count of Charolais, served in the Seven Years' War, and distinguished himself at the battles of Hastenbeck, Minden, and Johannisberg. He became the associate of the Dauphin. After the fall of the Bastille he emigrated. The murder of his young grandson, the Duc d'Enghien, by Napoleon, affected him profoundly. At the Restoration, he returned with Louis XVIII. to France, lived again at Chantilly, and was the author of an *"Essai sur la vie du grand Condé."* He died in 1818. The great family of Condé became extinct, Aug. 27, 1830, in the person of the DUC DE BOURBON, LOUIS HENRI JOSEPH.

CONDENSATION, the reduction of anything to another and denser form, as of a vapor or gas to a liquid, or a liquid to a solid; the passage of gases or vapors from the aëriform to the liquid state. It may be due to one of three causes: coolness, compression, or chemical affinity. When vapors are condensed their latent heat becomes free. The condensation of liquids is the reduction of a liquid to smaller bulk, with a proportionate increase in the sp. gr.

CONDENSED MILK, milk reduced greatly in bulk and rendered proportionately denser. GAIL BORDEN (*q. v.*) in 1849 invented a process for the condensation of milk, which has since been carried out extensively in the United States and Europe.

CONDENSER, one who or that which condenses.

Steam-engine.—An apparatus for reducing to a liquid form the steam in front of the piston, so as to obtain a partial vacuum at that point, and thus utilize the natural pressure of the atmosphere. Watt invented the injection condenser and the separate condenser. The surface condenser has a series of flat chambers or tubes, usually the latter, in which the steam is cooled by a body of water surrounding the tubes. Distilled water for ships' use is obtained by the condensation of steam in a surface condenser.

Distilling.—The still-condenser is an apparatus generally made of the worm-tub form; the coil containing the alcoholic vapor traversing a tub which receives a constant accession of cold water, condensing the vapor in the coil. The liquid escapes at a cock valve below.

Metal.—An apartment in which metallic or deleterious gaseous fumes are condensed to prevent their escape into, and contamination of, the atmosphere. The device consists of a prolonged duct for the fumes, with showers of water to condense the volatile matters.

Electricity.—(1) An instrument for concentrating electricity by the effect of induction. It usually consists of a confolded sheet of tin-foil, whose layers are separated by a thin sheet having a non-conducting surface.

(2) With induction apparatus, a device for absorption or suppression of the extra current, induced by the rapid breaks in the main current.

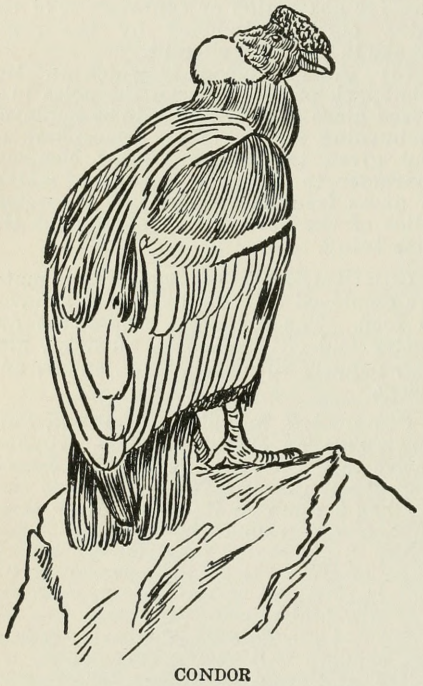
(3) An instrument in which an electric spark passes between the poles in a closed glass cylinder, so as to be employed in burning metals in an atmosphere of any given tenuity or specific chemical character, to obtain the spectra of metals or gases free from accidental characteristics of the general atmosphere for the time being.

CONDIMENTS, or seasoning agents, are employed at table to impart a flavor to food. The principal condiments are butter and olive oil, salt, mustard, ginger, pepper, vinegar, pickles, sugar, and honey.

CONDOR, a magnificent vulture, *Sarcoramphus* or *Sarcorhamphus gryphus*, native to the Andes, with a wing expansion of from 9 to 12 feet. The male condor has a comb on its head. Both sexes have a ruff round their necks. Their bodies are usually deep black, with a tinge of gray; the wing coverts in the males are white, at least at the tips; the legs are bluish-gray. Children are reputed to be in no danger from it, though two condors will attack the vicuña, the heifer, and even the puma. The species is found in most parts of the Andes, especially in Peru and Chile.

CONDORCET (kon-dor-sā'), **MARIE JEAN ANTOINE NICOLAS DE CARITAT, MARQUIS DE**, a French writer; born near St. Quentin, Sept. 17, 1743. At the age of 21 he presented to the Academy of Sciences an "Essay on the Integral Calculus," and in 1767 his "Memoir of the Problem of Three Points" appeared. The merit of his work gained for him in 1769 a seat in the Academy of Sciences, of which, after the publication of his "Eulogy on the Academicians having died before 1699" (1773), he was appointed perpetual secretary (1777). In 1777 his "Theory of Comets" gained the prize offered by the Academy of Berlin;

he enriched the "Transactions" of many learned societies; and took an active part in the "Cyclopedia." During the troubles of the first French Revolution his sympathies were strongly engaged on the side of the people. By the city of Paris he was elected deputy to the legislative assembly, of which he was soon appointed secretary, and in February, 1792, president. On the trial of Louis he was in favor of the severest sentence not capital. The fall of the Girondist party, May 31, 1793, prevented the constitution which Condorcet had drawn up from being accepted, and as he freely criticized the constitution which took its place, he was



CONDOR

denounced as being an accomplice of Brissot. He was forced to hide himself for 8 months, during which he wrote his "Sketch of an Historic Tableau of the Progress of the Human Mind." Fearing that Madame Verney, who sheltered him, would be punished for it, he fled Paris, was captured and imprisoned, and died March 28, 1794, probably of poison, self-administered.

CONDOTTIERI (kon-dōt-yā'rē), a class of mercenary adventurers in the 14th and 15th centuries, who commanded military bands, amounting to armies, on their own account, and sold their services for temporary engagements to sovereign princes and states. They took no interest in national contests, except to receive pecuniary advantages, the wars between them became a sort of bloodless contests, in which the only object of each party was to take as many prisoners as possible for the sake of the ransom. Only one Condottieri attained to high rank and independent power; this was Francesco Sforza, originally a peasant, who in 1451 made himself Duke of Milan, and transmitted that sovereignty to his descendants.

CONDUIT (kun'dit or kôn-dwē), a line of pipes or an underground channel of some kind for the conveyance of water.

CONE, in geometry, a solid figure described by the revolution of a right-angled triangle about one of the sides containing the right angle, which side remains fixed. If the fixed side be equal to the other side containing the right angle, the cone is called a right-angled cone; if it be less than the other side, an obtuse-angled, and, if greater, an acute-angled cone. The axis of the cone is the fixed straight line about which the triangle revolves. The base of a cone is the circle described by that side containing the right angle which revolves. Similar cones are those which have their axes and the diameters of their bases proportionals. (Euclid.)

In optics, a pencil of rays of light emanating from a point and diverging as they proceed on their course.

In astronomy, a conical-shaped shadow projected by a planet on the other side from that on which it is illuminated by the sun.

In geology, a conical mound or hill produced by the showering down around the orifice of eruption of scoriæ, dust, and the various other materials ejected.

In zoölogy (1) the English name of any shell of the large tropical molluscous genus *Conus*. The name also of any animal of that genus.

(2) Pl. (cones), the English name of the *Conidæ*, a family of Gasteropodous mollusks. See CONE-SHELLS.

In botany, a kind of anthocarpous or collective fruit, called also *Strobilus*, shaped somewhat like a mathematical cone, and consisting of an ament, the carpella of which are (scale-like) spread open, and bear naked seeds.

CONE, HUTCHINSON INGHAM, an American naval officer, born in Brooklyn in 1873. He graduated from the United States Naval Academy in 1894. During the war with Spain he served on the U. S. S. "Baltimore." He was commander of the flotilla of torpedo boats on the voyage from Hampton Roads to San

Francisco in 1908 and was fleet engineer of the Atlantic fleet on the tour around the world in 1908-1909. In 1909 he was appointed head of the Bureau of Steam Engineering with the rank of rear-admiral and engineer-in-chief. This was followed by service at sea as commander of several vessels. During the World War he was in command of the United States Naval Aviation Forces and was wounded on board the S. S. "Leinster" when she was sunk in the Irish Sea by a German submarine. He received many decorations from foreign countries for his service in the war and was a member of many naval and scientific societies.

CONE-SHELLS, or **CONIDÆ**, a family so called on account of their form. All the cones have a similar external outline; the aperture is long and narrow, the head of the living animal is more or less lengthened, the foot is splay and abruptly cut off in front, the tentacles are rather widely separate and the eyes are placed on these organs. The textile cone-shells, brought from Mauritius, a handsome species 4 or 5 inches in length, are marked with narrow, angular lines of dark brown, variegated with dashes of yellow and irregular white spots. The Admiral cone-shell is similar in appearance but smaller, and both species haunt the fissures and holes in rocks and the warmer pools in coral reefs. They all take a moderate range of depth, varying from 1 to 40 fathoms.

CONESSIBARK, the bark of *Wrightia anti-dysenterica*, an apocynaceous plant of India, used as a tonic, a febrifuge, and an astringent in diarrhœa.

CONEY ISLAND, a small island in the Borough of Brooklyn, about 10 miles S. E. of New York City. It is about 5 miles in length and from half to three-quarters of a mile in width; separated from the mainland by Coney Island creek. It is connected with New York and Brooklyn by steam and electric railroads and steamboat lines. It is a noted day summer resort, and has numerous bathing houses, hotels, concert and other amusement halls, carousels, pavilions, electric lights, and a fine cycle path connecting it with Prospect Park, Brooklyn. Brighton and Manhattan have extensive hotels, and are the preferred resorts for the wealthier class. Coney Island was one of the first landing places of the Dutch, and for over 200 years was considered a worthless waste. In 1840 steamboats began making excursions there, and for 25 years it was a popular resort. In 1875 steam railroads were built, and since then the island has been the most popular resort in the immediate neighborhood of New York City. In 1903 and again in 1911 public parks were opened by the city.

CONFEDERACY, UNITED DAUGHTERS OF THE, a woman's patriotic society founded at Nashville, Tenn., in 1894 to perpetuate the memory of those in the South who fought for or assisted the Confederate States of America in their fight for independence. To be a member of the society one must be a female descendant of one who rendered service to the Confederacy, either civil or military. There are chapters in all the Southern States, as well as elsewhere. The combined membership in 1920 was about 100,000.

CONFEDERATE STATES OF AMERICA, THE, the name adopted by the Southern States when they seceded from the Union and formed a government at Montgomery, Ala., Feb. 4, 1861. Delegates from the States of South Carolina, Mississippi, Florida, Alabama, Georgia, and Louisiana, adopted a Constitution and elected Jefferson Davis, of Mississippi, President, and Alexander E. Stephens, of Georgia, Vice-President. Texas, Arkansas, North Carolina, Tennessee, and Virginia afterward joined the Confederacy. Missouri and Kentucky were always in dispute and had representatives in both the United States Congress and the Confederate States Congress. The States which entered into the formation of the Confederacy had all passed ordinances of secession, withdrawing from the Union in full confidence that they not only had the legal right to do so, but were fully justified in their action by circumstances and the interests of their people. Historical precedent certainly seemed to give them the right of withdrawal.

After the first gun had been fired by John Brown at Harper's Ferry and when Major Anderson marched out of Fort Sumter in Charleston harbor, both sections were wild with excitement and there seemed nothing left but to fight it out to the bitter end. The odds in numbers and resources were overwhelmingly in favor of the North. The States which adhered to the Federal government (not counting Maryland, Kentucky, and Missouri, which furnished more troops to the Federal than to the Confederate armies) had a population of 20,000,000, while the white population of the Confederate States numbered only 5,000,000. The official reports of the Adjutant-General, United States army, show that there were actually mustered into the Federal armies during the war 2,778,304 men, while the Confederate Adjutant-General, Samuel Cooper, has shown that the Confed-

erates mustered into service only 600,000 men in all.

The South had to depend upon scant resources and material, and had no cause to be ashamed of its leaders, but could proudly point to its soldier-President, Jefferson Davis, and its generals, such as Robert Edward Lee, Albert Sidney Johnston, Joseph E. Johnston, P. G. T. Beauregard, "Stonewall" Jackson, Bedford Forrest, J. E. B. Stuart, Stephen D. Lee, Richard Taylor, Fitzhugh Lee, Wade Hampton, Kirby Smith, W. J. Hardee, John B. Gordon, Jubal A. Early, and others.

The Constitution of the Confederate States was modeled after that of the Federal Constitution, and in some important differences has won the approval of even Northern statesmen. It recognized Almighty God and invoked His favor and guidance. It guarded carefully the doctrine of the "sovereignty of each State." It expressly forbade the slave trade, or the importation of slaves from any foreign country other than the slave-holding States and Territories of the United States. It forbade "bounties" or "trusts" of any kind, and provided a "tariff for revenue." It gave Cabinet officers the privileges of the floors of its Congress, allowed the President to veto any part of a bill and approve the remainder, giving his reasons for such action, and fixed the term of office of the President at six years and made him ineligible for a second term.

The "Confederate States of America" passed away, but its survivors, their children and their children's children may proudly claim that in four short years the Confederacy made a name and a history which "the world will not willingly let die." See CIVIL WAR, AMERICAN.

CONFEDERATION, ARTICLES OF, a form of constitution adopted by the Continental Congress of the United States in 1777 and ratified by the colonies in the next four years. It provided for a Congress of one house only, in which each State should have one vote. This body was empowered to declare war and peace, make treaties with foreign powers, regulate the value of coin, etc., but as it had no power to enforce its laws upon the States, it soon fell into contempt and on March 4, 1798, expired by limitation under the provisions of the present Constitution.

CONFEDERATION OF THE RHINE, the league of Germanic States formed by Napoleon Bonaparte in 1806, and including Bavaria, Württemberg, Baden, Hesse-Darmstadt, the Kingdom of Westphalia, etc. It extended over 125,160 square miles, and comprised 14,608,877 inhabitants. The princes undertook to raise collectively a large body of troops in event of war, and established a diet at Frankfort; but the failure of Napoleon's Russian campaign of 1812 shook the structure, and the league soon after broke up. It was succeeded by a new league, the Germanic Confederation. See GERMANY.

CONFERENCE, in diplomacy, a meeting of the representatives of different powers for the purpose of adjusting differences; also, an annual gathering of the ministers, now with a certain number of lay representatives of the several Methodist congregations, to deliberate upon the affairs of the religious denomination to which they belong; also a meeting not held at stated intervals, but arranged to adjust some difference which may exist betwen Churches or sections of Churches.

Many conferences have taken place abroad between Churches or parties in Churches. Thus there were conferences between Lutherans and Roman Catholics at Ratisbon in A. D. 1601; one in 1685 between John Claude, of the French Reformed Church, and James Bénigne Bossuet, a Roman Catholic; and one at Thorn in 1645, with the view of reconciling the Lutherans and the Reformed Churches; but the conference to which the name is most frequently applied in England was that at Hampton Court.

The Hampton Court conference was a conference between King James I. of England, immediately after his accession to the English throne, and the representatives of the Anglican and the Puritan parties in the Church, which first met Jan. 14, 1604, and lasted three days.

CONFERVA, a genus of *algals,* the typical of the sub-order *confervæ* and the order *confervaceæ.* Most of the species are marine, though a few are fresh-water. Rabenhorst describes 30 in all.

CONFERVACEÆ, an order of flowerless plants, alliance *algales.* They are water-plants, generally green, but occasionally olive, violet, and red; most of them are found in fresh water, attached or floating, some in salt water, and a few in both. The confervaceæ bear the lichens cœnogonium and cystocoleus.

CONFESSIONAL, in Roman Catholic churches and chapels, a kind of inclosed seat in which the priest sits to hear persons confess their sins.

CONFISCATION, the act of condemning as forfeited, and adjudging to the public treasury, the goods of a criminal

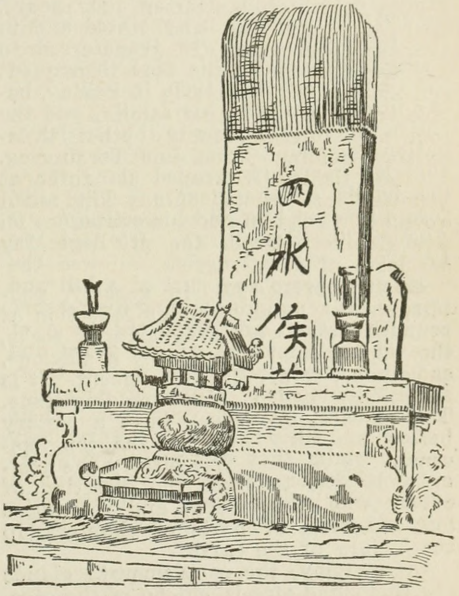
in part punishment of a crime. The subject of confiscating the property of those in rebellion was warmly discussed both in and out of the United States Congress at the beginning of the Civil War. A bill "to confiscate property used for insurrectionary purposes," etc., approved Aug. 6, 1861, providing for the immediate confiscation of all property belonging to office-holders under the Confederate government, and confiscation within 60 days after the President's Amnesty Proclamation of all property belonging to disloyal citizens or privates in the Confederate army, was passed by the House July 11, 1862, and the Senate the next day; and after a slight modification, suggested by the president in his veto of the same, on constitutional grounds, it was again passed by both houses on the 16th, and approved, becoming a law the next day. On July 22, the president issued an order that property needed for the support of the armies of the United States should be seized. After the United States entered the World War a number of German and Austrian ships in American harbors were seized. A custodian was also appointed for alien enemy property for the period of the war. A presidential proclamation, March 20, 1918, confiscated 68 Dutch ships in United States ports under the law of augury.

CONFLUENTES. See COBLENZ.

CONFORMABLE STRATA, beds which lie parallel to each other, the accumulation of the upper strata having followed the deposition of the underlying beds without any break or prolonged interruption. Conformity thus points to a continuity of the same physical conditions.

CONFUCIUS, or **KONG-FU-TSE,** that is, "the teacher, Kong," the famous Chinese sage; born about 550 B. C. in the province of Shantung, state of Lu. His father, Shuh-liang-heih, who was of royal descent, died three years later, and the boy was reared in comparative poverty by his mother, Ching-tsai. At the age of 17 he was made inspector of corn-markets, at 19 he married, and after about four years of domesticity, in which a son and two daughters were born him, he began his career as a teacher. In 517 B. C. he was induced by two members of one of the principal houses in Lu, who had joined his band of disciples, to visit the capital with them, where he had interviews with Laotze, the founder of Taoism. Driven from Lu to Tsi by a revolution, he soon returned thither with an increasing following, and at the age of 52 was made chief magistrate of the city of Chung-too. So striking a reformation was effected by him that he was chosen minister of crime, and with the aid of two powerful disciples elevated the state of Lu to a leading position in the kingdom. Its marquis, however, soon after gave himself up to debauchery, and Confucius became a wanderer in many states for 13 years.

In 483 he returned to Lu, but would not take office. The deaths of his favorite disciples, Yen Hwin and Tze-lu, in 481 and 478 did much to further his own, which took place in the latter year. Confucius left no work detailing his moral and social system, but the five canonical books of Confucianism are the "Yih-king," the "Shu-king," the "Shi-king,'" the "Le-king," and the "Chun-tsien," with which are grouped the "Four Books," by disciples of Confucius, the "Ta-hëo or Great Study," the "Chung-Yung or Invariable Mean," the "Tun-yu or Philosophical Dialogues," and the "Hi-tse," written by Meng-tse or Mencius. The teaching of Confucius has had, and still has, an immense influence in China. All his teaching was devoted to practical morality and to the duties of man in this world in relation to his fellowmen. It is doubtful if he had any real belief in a personal god.



GRAVE OF CONFUCIUS, CHEFOO, CHINA

CONGER, a large sea-eel, *Conger vulgaris* of Cuvier, *Muræna Conger* of Linnæus. It is of the family *Murænidæ.* It is 5, 6, or, in rare cases, even 10 feet

long. Its upper parts are brownish-white, and the lower dirty-white; the lateral line spotted with white, the dorsal and anal fins white margined with black. A smaller species, *C. myrus*, is found in the Mediterranean.

CONGER, EDWIN HURD, an American diplomatist; born in Knox co., Ill., March 7, 1843. He was graduated at Lombard University in 1862 and immediately enlisted in the Union army, attaining the brevet rank of major. At the close of the Civil War he studied law, graduating at the Albany Law School in 1866; practiced at Galesburg, Ill., removing to Iowa in 1868. He was elected to Congress in 1884 and twice re-elected as a Republican. In 1890 he was appointed Minister to Brazil, serving four years. In 1897 he was again appointed and in the following year was transferred to China. He was at his post throughout the Chinese crisis of 1900, in Peking, being imprisoned with his family, and the entire diplomatic corps in the British legation compound from June 20 to Aug. 15. He narrowly escaped slaughter at the hands of the Boxers. The allied forces rescued him and his colleagues on August 20. See CHINA. He died May 17, 1907.

CONGLOMERATE, in geology, pebbles, gravel, or any similar collection of rounded water-worn fragments of rocks, the whole bound together by a silicious, calcareous, or argillaceous cement. It is sometimes called also pudding-stone. The pebbles, or gravel, have a history before becoming fixed in the conglomerate. By reading that history the geologist is able to trace the direction of currents of water, etc., and recompose lost chapters, or parts of chapters, in the history of the earth.

In anatomy, the conglomerate glands are compound glands, chiefly of the racemose class. Examples — the pancreas, the salivary, lachrymal, and mammary glands, Brunner's glands, and most of the small glands that open into the mouth, the fauces, and the windpipe.

CONGO. See KONGO.

CONGREGATION, an assembly, generally a religious assembly; in its most ordinary use, an assembly of Christians met in one place for worship. In the Roman Catholic Church it often designates a sort of board of cardinals, prelates, and divines, to which is intrusted the management of some important branch of the affairs of the Church. Thus the Congregation of the Index examines books and decides on their fitness for general perusal. The word is also used in the Church of Rome to describe communities of ecclesiastics who live together under rule, but without being bound by vow, or at least by solemn vow. Such are the Congregation of the Oratory, the Congregation of the Most Holy Redeemer, usually called Redemptorists, etc.

CONGREGATIONALISM, or INDEPENDENCY, a form of evangelical Christianity which vests all ecclesiastical authority in the individual believers associated in a local church, complete in itself, but holding advisory cooperative relations with similar bodies. Congregationalism holds in common with other evangelical Christians the great facts of sin and of redemption through the incarnation and atonement of Christ as taught in the Bible. Congregationalism denies that there is any authority in Scripture for uniting the churches of a nation or province into one Church or corporation, to be ruled by a bishop or bishops, superior to the bishop or pastor of particular congregations or by a presbytery or synod consisting of the pastors or elders of the several congregations of the nation or province. This principle of Church polity is the specialty which plainly distinguishes Congregationalism from Episcopacy, Presbyterianism, Methodism, and all denominations whose churches are organized into a body having over its members any authority other than advisory.

Congregational polity is based upon three ideas: the right of each individual to take part in the government of the community; the autonomy of the local church; and its independence of all external ecclesiastical authority. While complete in itself, the local church may voluntarily unite with other churches for consultation and common action; but no resolution of any such union binds the individual church without its own consent. Usually each church has one minister or pastor, who is chosen by the free suffrages of the membership, but there may be more than one. In addition to the pastor or pastors, home missionaries and evangelists are sometimes appointed. Home missionaries and evangelists, if employed by a church for local service, are under the supervision of the church and not of the pastor, save as he is an agent of the church. Those commonly known as home missionaries and many evangelists, while members of some local church, are usually clergymen who have been formally inducted into the ministerial office according to the usages of the denomination.

Standing in the ministry is given (1) by the action of the church authorizing one of its members or any other person

it may deem qualified to exercise ministerial functions; (2) by the action of a voluntary association of Congregational ministers approving a candidate after due examination, and commending him for a limited time as such to the churches; (3) by an action of a Council of Churches called by some local church or acting in its name, ordaining a man as pastor or evangelist or missionary, or installing a minister as pastor of the church calling the council. The secular affairs of the church are administered by trustees appointed by the church or by an ecclesiastical society called the parish, made up of members of the congregation, not all necessarily members of the church. In some matters, like calling and installing a pastor, the church and the society act conjointly. The principles of this polity are held also by the Baptists, Unitarians, Universalists, and other denominations.

The first Congregational Church in England, of which there was any record, was formed in London about 1571. Robert Fitz was the minister, and his "True Marks of Christes Churche" is the first document relating to English Congregationalism known to be in existence. The most prominent name in connection with Congregationalism at this time is that of the Rev. Robert Browne, who left the Established Church, and, in conjunction with the Rev. Robert Harrison, formed a Congregational Church at Norwich in 1580. Another famous clergyman was John Robinson. The members of his church fled from persecution to Holland, and 12 years later crossed the Atlantic "landing at Plymouth, the Pilgrim Fathers of the Mayflower." In the cabin of the "Mayflower" was signed the famous compact which might be called the magna charta of American Congregationalism. At this time the Congregationalists were sometimes called "Brownists" (after the Rev. Robert Browne), sometimes "Separatists" (because they would keep the church separate from the world), and sometimes "Independents." This last designation Congregationalists themselves soon adopted, and have ever since retained.

Congregationalism in England. — In the Westminster Assembly (appointed by Parliament in 1643 to draw up some order of public worship for the nation), there were five representatives of the Congregationalists. Under Cromwell the Independents became supreme. Their church meetings were held in Westminster Abbey. At the time of the Protector's death (Oct. 12, 1658), a general council of Congregationalists was meeting in the Savoy. The council issued a "Declaration of Faith and Order." The "Declaration" was not binding upon any particular church, but it is almost as important in the history of Congregationalism as the Westminster Confession is in the history of Presbyterianism. The denomination was greatly and permanently strengthened by the Act of Uniformity (Aug. 24, 1662), which drove 2,000 ministers and many thousands of laymen out of the Established Church. Under the later Stuarts Congregationalists had their share of persecution. After passing the Act of Toleration (May 24, 1689), they took an active part in the extension of civil and religious liberty. They were chief among the founders of the London Missionary Society (1795), and the first tract for the Religious Tract Society was written by Dr. Bogue, in 1799. In 1831, the Congregational Union of England and Wales was formed, and an International Council of Congregationalists met in London in July, 1891.

Congregationalism in America. — In the United States the first Congregational Church was founded at Plymouth, New England, in 1620, by the party of pilgrims sent from Holland by John Robinson. In 1837, the spread of the Antinomian doctrine caused much discussion in the Church. By a synod convened in New England Antinomianism was unanimously condemned. In 1638 Harvard College was founded. In 1658 the Savoy Confession was adopted and still remains. Unitarian principles spread, about 1800, widely in the Congregational churches of America, and though a separation took place between the Unitarians and the Trinitarians, both still retain the Congregational form of church government.

In addition to the Conference, or Association of Churches, by which they cooperate for common ends, a National Council meets triennially "for advisory and not juridical ends." Beside such well-known colleges as Bowdoin, Amherst, Williams, and Oberlin, the American Congregationalists possess theological seminaries at Andover, Bangor, New Haven, Hartford, Oakland, Chicago, and elsewhere. There are six National Societies, through which the charities of Congregationalists mainly flow. There were in the United States in 1919 808,122 members of Congregational churches with 6,019 churches and 5,722 ministers. In the Sunday Schools were 709,859 pupils. The expenses of the church were $10,251,506. A five-year tercentenary campaign for a $5,000,000 fund for ministers' pensions was completed successfully in 1920.

CONGREGATIONAL METHODIST CHURCH, THE, a church founded in 1852 in Georgia by ministers and laymen of the Methodist Episcopal Church, with the purpose of following Methodist beliefs, but giving the congregations of the respective churches the controlling voice in church government. The first general convention of the church was held in 1855. The growth of the movement has been slow, for in 1913 they reported but 333 churches with somewhat over 15,000 members. The Atlanta Bible School is conducted under the auspices of this church. The official organ is "The Messenger," published at Ellisville, Miss.

CONGREGATIONISTS, the Scotch reformers. The whole body was called the Congregation; but from 1638, when they bound themselves by oath to adhere to the Solemn League and Covenant, the reformers were called Covenanters. Not unfrequently the Congregationists are called Covenanters.

CONGRESS, an assembly either of sovereign princes, or of the delegated representatives of sovereign States, for the purpose of considering matters of international interest. Even in the United States, though the term has now a different meaning, it had a similar origin, the first congress being that of the delegates from the various British colonies, who met on Oct. 7, 1765, for the purpose of considering their grievances. Previous to signing a treaty of peace, a meeting of plenipotentiaries usually takes place, to which the name of a congress is sometimes applied. It is more properly reserved for important meetings to decide great European questions. To this class belonged the famous Congress of Vienna in 1815; that of Carlsbad in 1819, for regulating the affairs of Germany; that of Paris at the end of the Russian war of 1854-1856; and that at Berlin after the Russo-Turkish war of 1877-1878.

CONGRESS, LIBRARY OF, an institution in Washington, D. C., established in 1800. It was destroyed in 1814 at the time of the burning of the Capitol by the British. It was again burned in 1851. It was housed in the Capitol until 1897, when it was removed to a building erected for it at a cost of nearly $6,500,000. It contains the largest collection of books in the Western Hemisphere. The library has grown constantly and in 1919 contained 2,710,556 books, 163,484 maps and charts, 848,292 volumes and pieces of music, and 409,029 prints. A copy of each book printed in the United States under the copyright laws is deposited in the Library of Congress. The library is supported by annual appropriations made by Congress. From 1899 Herbert Putnam has been librarian.

CONGRESS OF THE UNITED STATES, the legislative branch of the Federal Government, deriving its powers from the Constitution. It consists of a Senate and a House of Representatives. The powers of Congress are enumerated in Article 1, section 8, of the Constitution, and all powers not granted to Congress, or prohibited to the States, are reserved to the States or to the people; but the power of Congress is absolute within the scope of its authority. The Senate is composed of two members from each State, regardless of size or population; the members of the House are apportioned on the basis of population. Thus, while in the House the influence of the people is felt directly, according to their numbers, the Senate provides the means of defending the smaller States from the possible encroachments of the larger; and to assure the safety of the smaller States, the Constitution, Article 5, provides that "no State without its consent shall be deprived of its equal suffrage in the Senate." Bills that have passed both Houses are sent to the President, who may either sign or veto them, or do neither, in which case the bill becomes a law after 10 days unless Congress has previously adjourned. The veto of the President is the only check upon the power of Congress to legislate within the scope of its authority. Legislation exceeding the constitutional power of Congress will be declared unconstitutional by the Supreme Court, if that body is appealed to by either party to any controversy arising in an attempt to enforce such laws. Each House is, by the Constitution, "the judge of the elections, returns and qualifications of its own members."

In 1910 the 48 States were represented by 96 Senators and the ratio of Representatives was fixed at 1 to every 212,407 population. The 17th Amendment to the Constitution provided for a direct vote for Senators by the people.

CONGREVE, WILLIAM, an English dramatist; born near Leeds in 1670. He entered himself as a student at the Middle Temple, but abandoned the law for literature. His first piece, written at the age of 17, was a romance, entitled, "Incognito, or Love and Duty Reconciled." In 1693, being then only 23 years old, he wrote his first comedy, "The Old Bachelor." This produced him not only great reputation, but a commissionership

in the hackney-coach office, from the Earl of Halifax, who afterward still further patronized and favored him. He wrote also "Love for Love," "The Double Dealer," "The Mourning Bride," "The Way of the World," an opera, and some poems. He died in London, Jan. 19, 1729.

CONIFERÆ, an order of plants, one of those recognized in 1751, in the infancy of botany, by Linnæus. They belong to the class or sub-class of *Gymnosperms*. They are fine trees or shrubs abounding in resin. Lindley divides it into two sub-orders, (1) *Abieteæ*, with the ovules inverted and the pollen oval, curved; and (2) *Cupresseæ*, with the ovules erect and the pollen spheroidal. Sometimes the *Taxineæ* (Yews) figure as a third, but Lindley makes them a distinct order, and calls them *Taxaceæ* (Taxads). Nearly 200 species are known. They are most useful to man, supplying timber, with oil, resin, and turpentine. They are diffused over the world.

The wood of the coniferæ may be distinguished from those of ordinary dicotyledons by the absence of proper ducts in the woody layers, and by the presence of large areolar disks on the walls of the wood cells. The wood of the Yew (*Taxus baccata*), and the Douglas Fir (*Abies Douglasii*), are exceptions to this rule. On the other hand, the Wintereæ, which are not coniferous, but belong to the Magnoliads, have similar circular disks. The coniferæ commence at least as early as the Devonian. They are well represented in the Carboniferous rocks, being associated there with the higher Acrogens. They flourished through the Secondary period, and on to present times. The Carboniferous Conifers may have been taxoid (Yew-like), though the genus Pinites also occurs. The species in the Secondary rocks were more akin to the Araucaria of our gardens than to ordinary pines.

CONINGTON, JOHN, an English classical scholar; born in Boston, Aug. 10, 1825. He was educated at Beverley and at Magdalen College, Oxford. In 1854 he was appointed to the newly founded chair of Latin Language and Literature at Oxford, which he filled until his death, Oct. 23, 1869. His greatest work is his edition of "Vergil" (3 vols., 1861-1868). His edition of the "Agamemnon" (1848), and "Choephori" (1857), of Æschylus are of less moment. In his last years he gave himself much to translation; a metrical version of the "Odes" of Horace (1863), the "Æneid" (1866), in Scott's ballad-meter; the "Iliad" (1868), and the "Satires and Epistles" of Horace (1869).

CONISTON LAKE, in the English Lake district, in N. Lancashire; at the E. foot of the Coniston Fells, 9 miles W. of Bowness on Windermere. It is 5 miles long, ½ mile broad, 147 feet above the sea, and its greatest depth is 260 feet. Its waters abound with trout and perch. On the E. shore stand Ruskin's home, Brantwood, and Tent House, once Tennyson's residence. The Old Man of Coniston, to the N. W., is 2,633 feet high.

CONJUNCTION, in astronomy, one of the aspects of the planets. Two heavenly bodies are in conjunction when they have the same longitude—that is, when the same perpendicular to the ecliptic passes through both. If they have, at the same time, the same latitude—that is, if they are both equally far north or south of the ecliptic—they appear from the earth to be in the same spot of the heavens, and to cover one another. The sun and moon are in conjunction at the period of new moon. In the case of the inferior planets Mercury and Venus, there is an inferior conjunction when the planet is between the earth and the sun, and a superior when the sun is between the earth and the planet. In general, a heavenly body is in conjunction with the sun when it is on the same side of the earth, and in a line with him; and it is in opposition to the sun when it is on the opposite side of the earth, the earth being in a line between it and the sun. Planets are invisible when in conjunction with the sun, except in rare cases when an inferior planet passes over the sun's disk, and may be seen as a speck on his surface. Conjunctions are either *geocentric* or *heliocentric*, according as they are actually witnessed from the earth, or as they would be witnessed if observed from the sun. In observing a conjunction from the earth's surface it is usual to reduce the observation to what it would be if made from the earth's center; by this means the exact times of conjunction are more accurately fixed, and the observations of an astronomer made available to every other, wherever he may be on the earth's surface. Grand conjunctions are those where several stars or planets are found together. Chinese history records one in the reign of the Emperor Tehuen-hiu (2514-2436 B. C.), which astronomers calculate to have actually taken place.

CONJUNCTION, in grammar, a connective indeclinable particle serving to unite words, sentences, or clauses of a sentence, and indicating their relation to one another. They are classifiable into

two main groups: Coördinating conjunctions, joining independent propositions, and subdivisible into copulative disjunctive, adversative, and illative conjunctions; subordinating conjunctions, linking a dependent or modifying clause to the principal sentence. The only active influence which the conjunction can be said to exercise grammatically in a sentence is in respect of the mood of the verb following it in dependent sentences, the rule being to employ the subjunctive where futurity and contingency are implied, the indicative where they are not; as "I will do it though he be there" (which he may or may not be); or "I will do it, though he is there" (which he is).

CONJURING, the production of effects apparently miraculous by natural means. The earlier professors of the art claimed *bonâ fide* supernatural powers; and in ages when the most elementary principles of physical science were unknown beyond a very limited circle, it was not difficult to gain credence for such a pretension. The modern conjurer makes no such claim, but tells the public frankly that his marvels are illusory, and rest either on personal dexterity or on some ingenious application of natural principles. Of the conjurers of remote antiquity we have few reliable records; though it is a tolerably safe conjecture that the prestige of the ancient mysteries rested in no small degree upon effects of natural magic. The founder of the modern school of conjuring was Robert Houdin (1805-1871), with whom a new era began in 1841. He was followed by Frikell, Hartz, Herrmann, Buatier de Kolta, Verbeck, Lynn, Bertram, etc., producing their magical results with the minimum of visible apparatus. There are, however, signs of a reaction in favor of more spectacular illusions in which the resources of optical and acoustic, as well as mechanical science, are laid under contribution in aid of conjuring proper.

CONKLING, ROSCOE, an American legislator; born in Albany, N. Y., Oct. 30, 1829; was admitted to the bar in 1850; sat in Congress as a Republican in 1858-1862 and 1864-1866, and was elected to the United States Senate in 1867, 1873, and 1879. He became an influential member of his party; in 1876 he received 93 votes for the Presidential nomination, and in 1880, by his support of Grant and his personal opposition to Blaine, divided the Republicans into two sections. In 1881 he and his colleague, Thomas C. Platt, suddenly resigned from the Senate, owing to a dispute with President Garfield on a question of patronage, and sought re-election; but after a warm canvass both were rejected, though vigorously supported by Vice-president Arthur. Conkling afterward practiced law in New York City. He died April 18, 1888.

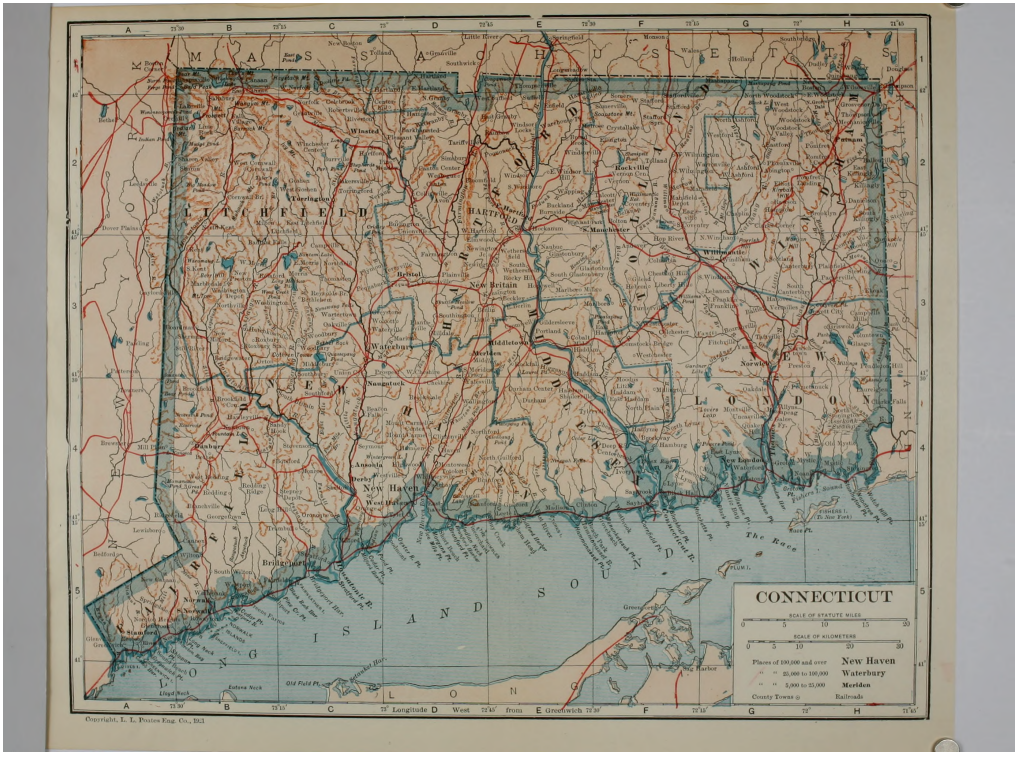
CONNAUGHT (kon'nât), the smallest of the four provinces of Ireland; between Leinster and the Atlantic; area, 4,392,086 acres. Its W. coast is much broken up by numerous bays and inlets, and is thickly studded with islands. A large proportion of the province is bog, and, generally, it is the least fertile of all the provinces. It is divided into five counties: Galway, Mayo, Roscommon, Leitrim, and Sligo. Pop. about 595,000.

CONNEAUT, a city of Ohio in Ashtabula co. It is on Conneaut creek and on the Lake Shore and Michigan Southern, the New York, Chicago, and St. Louis, and the Bessemer and Lake Erie railroads. It is an important port for the shipping of iron ore and coal. It has a good harbor and excellent shipping facilities. There are railroad shops and manufactures of canned goods, bricks, shovels, lumber, etc. There are hospitals, a public library, and a park. Pop. (1910) 8,319; (1920) 9,343.

CONNECTICUT, a State in the North Atlantic division of the North American Union; bounded by Massachusetts, Rhode Island, Long Island Sound, and New York; gross area, 4,845 square miles; one of the original 13 States; number of counties, 8; population (1890) 746,258; (1900) 908,420; (1910) 1,114,756; (1920) 1,380,631; capital, Hartford.

Topography.—Connecticut lies on the S. slope of the New England hill region, and while its surface is diversified by hills and valleys it is in only a few places over 1,000 feet in altitude. The highest elevation is Bear Mountain, Salisbury, 2,354 feet. The State is drained by three large rivers and their tributaries; the Connecticut, rising in New Hampshire, bisects the State in a N. and S. direction, and is navigable for 50 miles; the Thames, formed by the Shetucket, Yantic, and Quinnebang, is navigable as far as Norwich; and the Housatonic, with its main branch, the Naugatuck, navigable to Derby. The coast line is about 100 miles in length and affords many excellent harbors, of which New Haven and New London are the largest.

Geology.—The valley of the Connecticut river exhibits triassic sandstone and post-tertiary formation, but the greater part of the State is of eozoic or primary formation, which is separated into E. and W. sections by secondary rocks. Extensive trap dykes traverse the E. and W. sections, and boulders of great size on the hill tops, together with



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scratches on the mountain sides, are indications of a glacial passage down the Connecticut valley.

Soil.—Along the coast as far N. as Middletown the soil is very sandy; but the remainder of the Connecticut valley has a rich deep loamy soil. In the N. E. is a light gray loam and in the S. E. a dark argillaceous soil. The climate is temperate, and there are no swamps or marshes. The trees include several varieties of oak, pine, cedar, tamarack, chestnut, beech, wild cherry, ash, basswood, hickory, walnut, willow, poplar, dogwood, sycamore and holly.

Mineralogy.—Of various mineral productions iron ore is the most abundant. Copper and lead exist, but have never been mined with much profit. Silver occurs in minute quantities. There are immense quarries of red sandstone at Portland and Cromwell, and marble and limestone is quarried at Canaan and Washington, while the largest amount of orthoclase quarried in the United States comes from Glastonbury and Middletown. The total value of the mineral production is about $4,000,000 annually. Clay products rank first in value—about $2,000,000—and stone second, with a value of about $1,300,000.

Agriculture.—The agricultural interests of the State are very important. Cereals, fruits, and vegetables grow in great abundance in the W. valleys, and tobacco in the valley of the Connecticut. The acreage, production, and value of the chief crops in 1919 was as follows: Corn, 55,000 acres, 3,300,000 bushels, with a value of $5,940,000; hay, 340,000 acres, 544,000 tons, with a value of $16,429,000; tobacco, 25,000 acres, 39,000,000 pounds, with a value of $18,057,000; potatoes, 24,000 acres, 1,680,000 bushels, with a value of $3,276,000.

Manufactures.—Connecticut is one of the foremost manufacturing States in the Union. There were in 1914, 4,104 manufacturing establishments in the State, employing 226,264 wage-earners. The capital invested amounted to $620,194,000. There were paid in wages $125,220,000. The value of materials used was $288,511,000, and the value of the finished product was $545,472,000. The principal articles were cotton goods, foundry and machine shop products, hardware, and brassware. Other important manufactures are woolen goods, silk and silk goods, plated and britannia ware, hats and caps, brass castings and finishings, corsets, and worsted goods.

Banking.—In 1919 there were 66 National banks in operation, having $20,306,000 capital, $13,577,478 in outstanding circulation and $12,858,850 in United States bonds. There were also 3 State banks, with $550,000 capital, $12,179,000 in deposits, and $14,515,000 in resources. In the year sending Sept. 30, 1919, the exchanges at the United States clearing-houses at Hartford and New Haven aggregated $722,532,000.

Education.—The school population of the State is about 330,000, with an enrollment of about 250,000. There are about 8,000 teachers, with an average monthly salary of about $75. The annual expenses of the towns for educational purposes is about $10,000,000. For higher instruction there are public high schools, private secondary schools, public normal schools, at Bridgeport, New Britain, New Haven (State Normal School), and Willimantic, and Yale University, New Haven University, New Haven (opened 1701, Cong.); Wesleyan University, Middletown (1831, M. E.), and Trinity College, Hartford (1824, P. E.). Among the principal private secondary schools are: the Hotchkiss School, at Lakewood; Morgan School, at Clinton; Norwich Free Academy, at Norwich; and Bulkley School, at New London.

Charities and Corrections.—The charitable and correctional institutions include the Connecticut Hospital for the Insane at Middletown, the Norwich Hospital for the Insane at Norwich, the Connecticut State Prison at Wethersfield, the Connecticut School for Boys at Meriden, the Connecticut Industrial School for Girls at Middletown, the Connecticut Colony for Epileptics at Mansfield, and the Connecticut School for Imbeciles at Lakeville.

Railways.—There are about 1,000 miles of railway in the State. The New York, New Haven and Hartford has about 850 miles, the Central New York about 83 miles, and the Central Vermont about 58 miles. There has been practically no new construction of railways in recent years.

Finance.—The receipts for the fiscal year ending 1918 amounted to $15,198,326, and the expenditures to $13,706,034. There was a balance at the end of the year of $642,572. The State has a funded debt of about $12,000,000.

State Government.—The governor is elected for a term of two years and receives a salary of $5,000 per annum. Legislative sessions are held biennially. The legislature has 258 members in the House and 35 in the Senate, each elected for a term of two years. Connecticut sends five representatives to Congress.

History.—The first settlement in Connecticut was made at Hartford, in 1633, by the Dutch. The first constitution was adopted in Hartford in 1639, and formed

the basis of the charter of 1662. In 1686 the royal governor, Andros, attempted to obtain the charter, but, according to popular belief, it was hidden in the hollow of an oak tree. On the dethronement of James II. the colonial government resumed its functions. Connecticut took an active part in the French, Indian, Revolutionary, English (1812), and Civil Wars. She instructed her delegates in the Continental Congress to propose a declaration of independence, and was the fifth State to ratify the Federal Constitution. The Hartford convention, most memorable of gatherings in the State, assembled Dec. 15, 1814. It protested against the war with England and against the action of the national government with reference to State defense. This convention, which adjourned Jan. 5, 1815, raised the Federal party in the estimation of the people.

CONNECTICUT, a river of the United States, the W. branch of which forms by treaty the boundary between the United States and Canada to lat. 45° N. It rises on the N. border of New Hampshire; forms the boundary between Vermont and New Hampshire, passes through the W. part of Massachusetts and the central part of Connecticut, and falls into Long Island Sound. It is navigable for vessels drawing from 8 to 10 feet for about 300 miles from its mouth, subsidiary canals, however, being required above Hartford; total length, 450 miles. It is famed for its shad fisheries.

CONNECTICUT COLLEGE FOR WOMEN, an institution for the higher education of women, founded in New London, Conn., in 1911. The college has received generous gifts for endowment, including $1,000,000 from Morton F. Plant. It was officially opened in September, 1915. In 1919 there were 42 teachers and 304 students. President, B. T. Marshall.

CONNECTICUT RESERVE. See WESTERN RESERVE, THE.

CONNELLSVILLE, a borough in Fayette co., Pa.; on the Youghiogheny river, and the Baltimore and Ohio, the Pennsylvania, the Pittsburgh and Lake Erie, and the Western Maryland railroads, 57 miles E. of Pittsburgh. It is the center of the most extensive coke burning region in the United States. Other important industries are machine shops, pump works, brick works, and coal mining. It is the seat of Cottage State Hospital; and has electric lights, electric railways connecting with South Connellsville and adjacent towns, several newspapers and National banks. Pop. (1910) 12,845; (1920) 13,804.

CONNEMARA ("the Bays of the Ocean"), a boggy and mountainous district occupying the W. portion of County Galway, Ireland; about 30 miles in length and 15 to 20 miles in breadth. Its coasts are very broken, and there are numerous small lakes. It is subdivided into Connemara Proper in the W., Jar-Connaught in the S., and Joyce's Country in the N.

CONNERSVILLE, a city of Indiana, the county-seat of Fayette co. It is on the Cincinnati, Hamilton and Dayton, the Cleveland, Cincinnati, Chicago and St. Louis, and the Fort Wayne, Cincinnati and Louisville railroads, and on the White Water river. It has manufactures of motor cars, pianos, carriages, furniture, flour, etc. There is a public library, an excellent high-school building, a park, and a sanitarium. Pop. (1910) 7,738; (1920) 9,901.

CONNING TOWER, the place in modern battleships where the commander stands during a naval engagement, and from which he directs the movements of the ship and men. The conning tower is built over the foreward turret and is a circular chamber, scarcely 6 feet across and protected by walls of steel 12 inches thick. The roof is also of solid steel. Between the arched roof and the walls is a narrow slit from which the eye can sweep the whole horizon. The sharp-pointed bow of the boat is just below, and directly in front are the two big guns that protrude from the turret. Throughout the engagement the commander is invisible to his men, his voice alone being heard through the speaking tubes and telephone with which the turret is fitted. In its center are the steam-steering wheel, binnacle and compass, and by the directing hand of the commander, standing beside the compass, the battle is fought.

CONNOLLY, JAMES BRENDAN, an American writer, born in Boston, Mass. He was educated in the public schools and for a time served with the United States Engineer Corps. In 1896 he won the first Olympic championship of modern times. During the Spanish-American War he served with the 9th Massachusetts Infantry. He was a member of the National Institute of Arts and Letters. His novels include "Out of Gloucester" (1902); "The Deep Sea's Toll" (1905); "The Trawler" (1914); "Running Free" (1917), and "The U-Boat Hunters" (1918).

CONNOR, RALPH (REV. CHARLES W. GORDON), a Canadian author, born at Glengarry, Ont., 1860. He was edu-

cated at the high school, St. Mary's, Ont., Toronto University, and King's College, Toronto. He was missionary to miners and lumbermen in the Rocky Mountains, 1890-1903; and representative of Canadian Western Missions for the Presbyterian Church in Great Britain, 1893-1894. He took an active part in social service work, and during the World War was chaplain with the Canadian forces at the front. His works include: "Beyond the Marshes," "Black Rock," "The Sky Pilot," "Ould Michael," "The Man from Glengarry," "Glengarry School Days," "Breaking the Record," "The Prospector," "The Pilot of Swan Creek," "Gwen: The Doctor of Crow's Nest," "Life of Dr. James Robertson," "The Foreigner," "The Angel and the Star," "The Dawn by Galilee," "The Recall of Love," "Corporal Cameron." etc.

CONOID, in geometry, a surface generated by a straight line moving in such a manner that it constantly touches a curve and another straight line; similar to the cone, but having a straight line instead of a point for its apex.

CONON, a celebrated astronomer of Samos, who lived in the 3d century B. C.

CONNOR, RALPH. See GORDON, CHARLES WILLIAM.

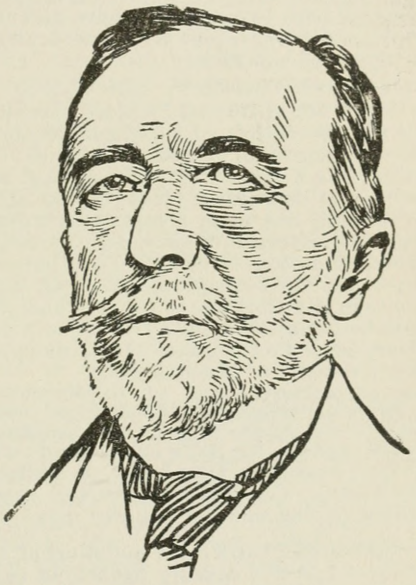
CONRAD I., Duke of Franconia; was elected King of Germany in 911; but Arnulf, Duke of Bavaria, and Henry, Duke of Saxony, disputed his title, and engaged the Huns to overrun Germany. Conrad is said to have received a mortal wound in combat with these revolted chiefs. He died in 918.

CONRAD II., son of Henry, Duke of Franconia; was elected King of Germany in 1024. Attempts were made to displace him, but without success, and in 1027 he was crowned emperor at Rome, in the presence of Canute, King of England, and Rudolph, King of Burgundy. As heir to Rudolph, who died in 1033, Conrad became King of Burgundy. He died in 1039.

CONRAD III., Duke of Franconia, of the house of Hohenstauffen; born in 1093; was elected emperor in 1138. His title was disputed by Henry the Proud, Duke of Saxony, and the rivalry of these two princes was the germ of the factions afterward so famous under the names of Guelfs and Ghibellines. In 1146, at the diet held at Spire, Conrad was persuaded by the eloquence of St. Bernard to undertake a crusade, on which he set out the following year. It was fruitless and disastrous, and Conrad returned with the wreck of his army in 1149. He died in 1152.

CONRAD IV., Duke of Suabia, chosen King of the Romans in 1237, son of the great Emperor Frederick II., and like him was excommunicated by the Pope, Innocent IV., who set up a rival emperor in William, Count of Holland. On the death of his father, in 1250, Conrad marched into Italy to recover the towns which had declared against him. He took Naples, but could not get the investiture of the kingdom of Sicily from the Pope. He died in Italy in 1254. See CONRADIN.

CONRAD, JOSEPH an English novelist, of Polish birth and ancestry, born in 1856. His full name was Joseph Conrad Korzeniowski. When his father died,



JOSEPH CONRAD

young Conrad, then a boy of 13, wandered from Poland to Marseilles, France, where he joined a French vessel and rose to be a captain in the merchant service. Later he held an office on an English ship and late in life learned the English language. With this handicap he yet learned to write novels in clear idiomatic English and became one of the foremost modern English novelists. He is at his best in his portrayal of the life of the sailors in the southeastern seas, his studies of the contact of the western European with the Oriental mind being extremely subtle and interesting. His most successful novels are "Gales of Unrest" (1898) and "Lord Jim" (1900), both stories of sailor life in the East. Among his other works are "Typhoon" (1902);

"The Mirror of the Sea" (1906); "Point of Honor" (1908); "Twixt Land and Sea" (New York, 1913); "Victory" (1917).

CONRADIN, the son of Conrad IV., Duke of Suabia, and the last of the house of Hohenstauffen; born in 1252. As the greatest part of the possessions of his family had been swept away, Conradin accepted the invitation of the Italian Ghibellines to place himself at their head. He crossed the Alps with 10,000 men; was well received at Verona, and, notwithstanding the treason of his relatives, Meinhard and Louis of Bavaria, who left him with but 3,000 men, he entered south Italy. Charles d'Anjou, on whom the crown of Naples had been bestowed by Pope Urban IV., met Conradin at Tagliacozzo, defeated him, and caused him to be beheaded, in 1268.

CONSANGUINITY, the quality or state of being related by blood; nearness of kin; descent from a common ancestor. Consanguinity is of two kinds, lineal and collateral. Lineal subsists among persons who descend in what may be called a straight line from a common ancestor; thus grandfather, father, son, grandson, great-grandson have lineal consanguinity. Collateral consanguinity is when there is descent from a common ancestor, but not in a direct line; as grandfather, father, his brother, son of the first, etc. Here the line is not direct.

CONSCIOUSNESS, the state of being conscious; knowledge or perception of what passes in one's own mind. Internal sense or knowledge of guilt or innocence. Consciousness is the recognition by the mind of its own acts.

CONSCRIPTION, the enlisting of the inhabitants of a country capable of bearing arms, by a compulsory levy, at the pleasure of the government, being thus distinguished from recruiting, or voluntary enlistment. The word and the system were both introduced into France in 1798 by a law which declared that every Frenchman was a soldier, and bound to defend the country when in danger. On the restoration of the Bourbons conscription was abolished. It was, however, re-enacted, and continued through the Second Empire to form the mode of recruitment in France. An army-bill, passed by the National Assembly in 1872, affirmed the universal liability to conscription, but allowed certain exceptions and postponements. The term of service was fixed at 5 years in the active army, 4 years in the reserve of the active army, 5 years in the territorial army, and 6 years in its reserve—the total length of military service being thus 20 years. Universal liability to military service is the law in Italy, and was in Germany and Austria until abolished in these two countries by the Peace Treaty of 1919 following the World War. Under the Empire the Russian army was raised by conscription, all men who completed their 21st year being liable. Great Britain and the United States began conscription in 1916 and 1917, respectively, of the World War (1914-1918).

CONSECRATION, the act of solemnly dedicating a person or thing to the service of God. In the Jewish law, rites of this nature are frequently enjoined, the Levites and priests, the tabernacle and altar, etc., being specially dedicated or consecrated to God. Among Christians the word consecration describes—the ordination of bishops. The Nicene Council requires the ceremony to be performed by not less than three bishops. This rule is maintained by the Church of England. Among Roman Catholics the Pope may permit Consecration by one bishop and two priests. The hallowing of the elements in the eucharist, by the words of institution according to Roman Catholics and Anglicans; by the invocation of the Holy Spirit according to the Greeks. The dedication of churches. The rites have become long and elaborate in the Church of Rome. In the English Church the bishop chooses his own form. That most generally used was drawn up by the Anglican episcopate in 1712. In the American Episcopal Church a form was appointed in 1799. The benediction of abbots and abbesses according to forms prescribed in the Roman Pontifical. It is usually performed by a bishop. The consecration of altars, chalices, and patens by the bishop with the chrism or hallowed oil. The consecration of altars is mentioned by councils of the 6th century, that of chalices and patens in the Gregorian Sacramentary.

CONSERVATION, the act of preserving, maintaining, supporting, or protecting. The conservation of energy is a principle based on the general one that energy communicated to a body or system of bodies is never lost; it is merely distributed and continues to exist as potential energy, as motion or as heat. It now stands as one of the axioms of physics, and is sometimes called correlation of forces.

CONSERVATION, the purpose of the movement for the conservation of the natural resources of the United States is to protect from wasteful use and from

private monopoly the minerals, waters, land, and forests. The conservation movement was really started by Gifford Pinchot, head of the Forestry Department under President Roosevelt. Observing the waste of natural resources that was daily taking place in the United States, he urged upon the President the necessity of action. President Roosevelt issued a call for the governors of all the States to meet with him at the White House on May 15, 1908, to devise measures to deal with the situation. The result of the conference was a declaration to the nation of the need of co-operation between the States and the National Government to preserve for posterity the great natural wealth of the United States. Conservation commissions were appointed soon afterward by nearly all the States to make an inventory of their natural wealth and to suggest means for preserving the same. On June 8, 1908, President Roosevelt appointed the National Conservation Commission, naming Pinchot as chairman for the purpose of drawing up an inventory of the natural resources of the nation. This report was made the following year and contains some startling facts. The commission discovered that the waste in the extraction of minerals in the United States amounted to over three hundred millions of dollars a year, and that if present rate of use of the high grade iron ores was continued the supply would be exhausted within the century. Similarly the end of the supply of petroleum was within sight, unless unexpected sources should be discovered. The waste in natural gas was found to be appalling, enough being wasted to supply nearly half the people of the United States with fuel. Of the five tons of coal used per capita three tons per capita were wasted.

While it was found that conservation of forests was being practiced on most of the land owned by the public, four-fifths of the standing timber in the United States was privately owned and was being frightfully used up. Not counting fires which destroy $50,000,000 worth of timber every year, the United States was taking from the forests every year nearly four times their natural growth. If this be continued, the commission estimated that long before the century was over the United States would be in want of timber.

The waste in water power was found to be even more pronounced, less than 3 per cent. of it being used for municipal supplies and for irrigation, whereas if used to the fullest extent available the power generated would be sufficient for the entire mechanical needs of the nation.

Following this analysis of the condition and use of our natural resources steps followed which were designed to deal adequately with it. The national forests which contain nearly one-fifth of the standing timber of the United States have been so administered in the past ten years as to put great quantities of timber to good use, while protecting the new growth and the headwaters of all the important Western rivers. The area of the national forests was greatly increased until in 1919 it had reached 153,933,700 acres and yielded an income of nearly five million dollars. Yet, notwithstanding the really excellent care our national forests have lately received, the available timber supplies have not kept pace with the demands. This is largely because 97 per cent. of the forests are in private hands and therefore difficult to regulate. Steps were being taken in 1919 and 1920 to educate the owners in the proper use of their forests and to encourage reafforestation. The airplane was used by the Forest Service in 1919 to guard the forests and to locate forest fires; it is hoped that this will lessen the enormous loss incurred by these conflagrations.

The conservation movement has likewise operated to induce caution in the sale of mineral lands without proper compensation to the Government and strict regulations to insure their being efficiently exploited. President Roosevelt by his own authority withdrew from settlement many thousands of acres of public land until Congress should pass appropriate laws for their protection. During the following administration this was done. The attempt by President Taft, through his Secretary of Interior Ballinger, to open up the vast mineral deposits of Alaska for use, was unsuccessful largely because Gifford Pinchot, United States Forester, was not satisfied that the interests of the public were being protected. While Secretary of the Interior in the Wilson administration Franklin K. Lane saw the completion of a railroad in Alaska and also by direction of Congress insured that the great mineral resources of that country should be developed in consonance with sane conservation principles.

Perhaps in no field covered by the conservation movement was waste more apparent than in the use of water power. Not only was waste in evidence, but what use was being made of water power was centered in private monopoly. Due largely to the conservation movement, this tendency to center a large amount

of the available water power in a few hands has been checked. During the Wilson administration Congress passed laws for the development of the water powers of the national forests and of the public domain which gave fair terms to the interests desiring to exploit them and also protected the public interests.

The National Conservation Commission discovered that agriculture in the United States had decreased the fertility of the soil instead of increasing it as had been the case in most European countries. To meet this evil, experimental stations were opened by the Department of Agriculture, and an extensive campaign of education of the farmers in better methods of tilling the soil was undertaken. At the same time the Department of Interior took up the task of irrigating and reclaiming for use vast desert areas of the West. From 1902 until June, 1919, the Reclamation Service had spent nearly $150,000,000 on projects designed to reclaim land for use. When all the projects under construction are completed 3,200,000 acres of formerly waste land will be irrigated. 1,120,000 acres were already being irrigated in 1919.

CONSERVATION OF FOOD, an economic problem which first became the object of serious consideration by governments during the World War. The axiom that "every army fights on its stomach" was suddenly found to be as true of the nations at war as a whole. Two important causes were behind this increased significance of the food supplies of the civil populations of the belligerent countries. First of all, the tremendous increase in transportation facilities between the countries during the past half century had made the peoples of those countries more mutually dependent on each other, because of the ease with which the products of labor could be exchanged, and more especially foodstuffs. Whereas in earlier times each country was more or less economically self-sufficient, they now depended on each other for certain food products, in some cases almost completely. As an instance, England was dependent on foreign importations for almost all her food supplies. To a lesser extent, this was also true of Germany. The war, naturally, by severing commercial relations between the two sets of belligerents, and making it extremely difficult between the countries that were allied together, forced each country back into a position of being again dependent on its own food resources.

Another reason for the need of food conservation was the number of countries involved in warfare, and the great percentage of the laboring population which must be drawn into the military establishments. In no previous war had there been such a drain on the laboring population for fighting purposes, and never before had this drain been so universal throughout practically all of the civilized world. This seriously hampered the production of food, even in countries which had large sources of food supply within their own boundaries. Such was especially the case in Germany and Hungary, possessed of large areas of grain producing lands, but where each was compelled to draft its peasants into their respective armies.

Germany was the first to feel the pressure, for, though she had the wheat fields of Hungary behind her, the demands for transportation of men and military supplies made on the railroads seriously hampered the transportation of foodstuffs. Having anticipated this situation, however, the German Government had made full preparations, and at once systematized her food conservation policy from the very beginning, with such a high degree of scientific efficiency that it is probable that the German civil population did not suffer from scarcity so soon as did those of belligerents more favorably situated. An Imperial Food Control Board was at once established, which took over all the food stored in the country and assumed the responsibility of distribution, regardless of the purchasing power of the units of the population. Heads of families, of all classes, were supplied with food rationing cards, by means of which they were enabled to receive only so much food as was necessary for physical maintenance. A national food inventory was kept by the Imperial Board, with the same accuracy with which the quartermasters' department of an army keeps a record of its food supplies, and when the stores decreased, the rations were diminished in proportion. Thus, the German population was often hungry, but there was no famine. This same system was installed in Austria and Hungary, but was not administered with the same high degree of efficiency, with the result that the civil populations of those countries, especially in the larger cities, suffered more severely.

In France and England, whose governments and populations were more taken by surprise by the war, such elaborate preparations had not been worked out. At a later period the rationing system was partially applied, in certain commodities, but both these countries were more fortunate in that they were

able, throughout the whole course of the war, to draw food supplies from neutral countries, especially from Canada, the United States and the South American countries, this supply being only limited by transportation facilities.

When the United States entered the war, in 1917, food conservation also became a very serious administrative problem in this country, though for a different reason. There was no fear of a scarcity of home supply, so far as the domestic population was concerned, even though several millions of young men were drafted for the army, most of them from the rural districts. But the moment the country decided to engage in hostilities on the side of the Entente, the Government at once assumed the responsibility of supplying the European Allies with the food they so sorely needed, and to do so immediately there was begun a tremendous fleet of cargo vessels. In the words of President Wilson, as uttered in his proclamation in January, 1918, there was needed "a more intensive effort on the part of our people to save food, in order that we may supply our associates in the war with the sustenance vitally necessary to them in these days of privation and stress."

On Aug. 10, 1917, Congress passed the Food Control Act, authorizing the President to assume control of the production and distribution of food products during the full period of the war; to commandeer stores; to license export, manufacturing, etc.; to suppress "profiteering"; and even to buy directly from the producers and sell to the consumers certain food commodities, including coal. Herbert C. Hoover was appointed head of the new Food Administration, to enforce the provisions of the Food Control Act. He immediately announced that he would bend all his efforts to the elimination of private speculation in food, and that there would be a strict supervision of the private export of food stuffs. He would also prepare a detailed program for the elimination of waste and food conservation which the people would be asked to put into practice voluntarily.

On Aug. 14 President Wilson issued a proclamation requiring all persons engaged in the wheat and rye trades to apply for licenses. Exception was made of those operating mills producing less than one hundred barrels of flour and farmers' co-operative sales associations. September 11th was set as the day on which all licenses must be applied for. At the same time Mr. Hoover appointed a special commission, on which were represented the producers, middlemen, and consumers, to determine a fair price for the 1917 crop of wheat. Fifty million dollars was appropriated for the purchase of the bulk of the wheat crop, so that the producers would be assured of a certain maximum price and the consumers of a minimum retail price. Next, all dealers were required to apply for licenses, including such retailers as did a business of over $100,000 a year.

Meanwhile the program of the Food Administration to insure economy was proclaimed and became effective on Jan. 28, 1918. To reduce the consumption of wheat by a third, as was proposed, retailers were compelled to sell flour on what was called the fifty-fifty plan; for every pound of flour sold they must sell a pound of some other cereal. Bakers were compelled to bake what was called the victory loaf: bread in which the flour of other cereals was mixed with that of wheat. The people were urged to observe wheatless Mondays and Wednesdays. By March, 1918, retailers were made to restrict their sales of wheat products to one and one-half pounds per person per week. Victory bread now included 25 per cent. of non-wheat flours.

Meatless Tuesdays and porkless Saturdays were also proclaimed. In March, 1918, these two restrictive days were rescinded, but in the following June housewives were requested to limit their purchases of beef to one and one-fourth pounds weekly. Restaurants could serve roast beef and beefsteak only one day a week, and boiled beef on two days a week. The consumption of poultry products, and especially eggs, was urged, and for a while, from February to April, the traders in freshly killed fowl were not required to carry licenses. Meanwhile the shortage of sugar had become extremely acute and in August a sugar rationing program was instituted, which allowed each person only two pounds of sugar a month. Exception was made in the case of housewives who wished to can fruits and berries, which was strongly urged, and they could procure extra amounts of sugar by special license. By September, when it became obvious that a good crop of cereals was insured, the restrictions on flour were raised so far as consumers were concerned, but President Wilson issued a proclamation forbidding their use in the production of spirituous liquors, a measure which was later fortified and amplified by special Federal legislation, to endure until demobilization.

After the signing of the armistice one after another of the various restrictions were removed, and high prices took the place of scarcity. By the measures taken

by the Food Administration it was announced that between July and November the sugar distribution had been economized to the extent of 775,000 tons. On June 30, 1919, the administration of the Food Controller came to an end, and competition was again fully restored, except in the case of sugar, which was continued on into 1920.

CONSERVATIVE, as applied to one of the two great parties in English politics, was first used by J. W. Croker in an article in the "Quarterly" for January, 1830. Conservative began to supersede Tory about the time of the Reform Bill controversies. The plural form of the word has been assumed as a distinctive name by certain political parties in many nations. These parties are sometimes actually, and always avowedly, opposed to changes from old and established forms and practices. In United States history these names have never been in general use, but in Van Buren's administration the name of Conservatives was applied to those Democrats that at the special session of Congress, of September, 1837, opposed the establishment of the sub-treasury system. In the Congress that met in December, 1839, they had practically disappeared. The name was also assumed by Southern whites during the reconstruction period following the Civil War, to show their adherence to the old State governments, the abolition of which by Congress they opposed. In Virginia the name was in use until 1872. The name was also used at the North during this period. The Democrats applied it to themselves to draw moderate Republican votes.

CONSERVATORY, a name given on the European continent to a systematic school of musical instruction. In Great Britain the term is usually applied to foreign schools of music. Conservatories were originally benevolent establishments attached to hospitals, or other charitable or religious institutions. In Naples there were formerly three conservatories for boys; in Venice four for girls; the Neapolitan group being reduced in 1818 to a single establishment under the name of the Royal College of Music. In Milan, a conservatory was established in 1808. In France the musical school established in connection with the Opera received its final organization in 1795 under the name of *Conservatoire de Musique*. The Conservatorium, founded at Leipzig in 1842 under the auspices of Mendelssohn, is one of the most influential in Germany. Institutions of the same description are established in the capitals and large cities of Europe and the United States.

CONSERVATORY, in gardening, is a term generally applied by gardeners to plant-houses, in which the plants are raised in a bed or border without the use of pots, the building being frequently attached to a mansion.

CONSERVE, a form of medicine in which flowers, herbs, fruits, roots, are preserved as nearly as possible in their natural fresh state.

CONSHOHOCKEN, a borough of Pennsylvania, in Montgomery co. It is on the Pennsylvania and the Philadelphia and Reading railroads, and on the Schuylkill river. It has rolling mills, foundries, furnaces, rubber works, cotton and woolen mills, and steel mills, and is an important manufacturing center. Pop. (1910) 7,480; (1920) 8,481.

CONSPIRACY, a secret agreement or combination between two or more persons to commit any unlawful act that may injure any third person or persons. Every act of conspiracy is a misdemeanor at common law. In June, 1900, the House Committee on the Judiciary of the United States Congress, reported a bill that aroused widespread interest in the labor and business world because it contained a definition of the word conspiracy. The bill provided "That no agreement, combination or contract by or between two or more persons to do or procure to be done, or not to do or procure not to be done, any act in contemplation or furtherance of any trade dispute between employers and employees in the District of Columbia or any Territory of the United States, or who may be engaged in interstate or foreign trade or commerce, shall be deemed criminal, nor shall those engaged therein be indictable or otherwise punishable for the crime of conspiracy if such act committed by one person would not be punishable as a crime, nor shall any restraining order or injunction be issued with relation thereto. Provided, that the provisions of this act shall not apply to threats to injure the person or the property, business or occupation of any person, firm, association or corporation, to intimidation or coercion, or to any acts causing or intended to cause an illegal interference by overt acts with the rights of others.

"Nothing in this act shall exempt from punishment, otherwise than as herein excepted, any persons guilty of conspiracy for which punishment is now provided by any act of Congress, but

such act of Congress shall, as to the agreements, combinations and contracts hereinbefore referred to, be construed as if this act were therein contained."

CONSTABLE, ARCHIBALD, a Scotch publisher; born in 1774. He was the original publisher of the "Edinburgh Review," the poems of Sir Walter Scott, the "Waverley Novels," the "Supplement to the Encyclopædia Britannica," and other valuable works. In 1825 he projected the well-known series of works, "Constable's Miscellany." In 1826, however, the firm was compelled to stop payment with liabilities exceeding $1,250,000. Sir Walter Scott, who was heavily involved, practically sacrificed his life in the endeavor to meet his creditors, and Constable himself died in 1827.

CONSTABLE, JOHN, an English landscape painter; born in East Bergholt, Suffolk, June 11, 1776; son of a miller. He studied at the Royal Academy; began with portraits and history, but finally fixed upon landscape as his vocation. The National Gallery has his best pictures, "The Cornfield," "The Valley Farm," and "The Hay-wain." In 1824 some of his pictures were exhibited at the Paris Salon, and excited great interest among the French artists. To these pictures of Constable a more powerful influence upon modern French landscape art has been ascribed than the facts will warrant. Paul Huet, Théodore Rousseau, and Diaz were all working before Constable's pictures went to France; but they were working in obscurity. Georges Michel, one of the greatest of these men (born 1763, died 1843), was entirely independent of Constable; but he was hardly known to his own time. What Constable's pictures did was to make a conspicuous rallying-point for the new school. Mr. Henry Marquand presented two fine Constables to the Metropolitan Museum of Art in New York City. Constable died in London, March 30, 1837.

CONSTABLE OF BOURBON. See BOURBON, CHARLES, DUKE OF.

CONSTANCE (Ger. *Constanz*, or *Konstanz*, ancient *Constantia*), city and lake-port of Germany, in the grand-duchy of Baden, occupying the only territory belonging to Germany on the S. side of the Lake of Constance. The chief edifices are a cathedral, the Kaufhaus, in which the famous Council of Constance sat from 1414 to 1418 (and which deposed three anti-popes, and condemned Huss and Jerome of Prague); an ancient palace; a grand ducal residence. One of its suburbs is connected with it by a long covered bridge across the Rhine. The city has manufactories of cotton goods, carpets, chemicals, and sacking. Constance is said to have been founded in 378 A. D. by Constantius Chlorus as a bulwark against the Alemanni. In the Middle Ages, when it reached the height of its prosperity, it was frequently called Kostnitz. It was annexed to the Austrian dominions in 1549, and to Baden in 1805. Pop. about 30,000.

CONSTANCE, LAKE OF (ancient *Lacus Brigantinus;* German *Bodensee*), a lake of central Europe, in which Switzerland, Baden, Württemberg, Bavaria, and Austria meet; forming a reservoir in the course of the Rhine; length N. W. to S. E. 42 miles, greatest breadth about 8 miles; area 207 square miles. At its N. W. extremity the lake divides into two branches or arms, each about 14 miles long; the N., called Überlingersee after the town of Überlingen, on the N. bank; the S. the Zellersee, or Untersee, in which is the fertile island of Reichenau, 3 miles long. The lake, which is of a dark-green hue, is subject to sudden risings, the causes of which are unknown. It freezes in severe winters only. The traffic on it is considerable.

CONSTANT, JEAN JOSEPH BENJAMIN, a French portrait painter; born in Paris, June 10, 1845. He studied in the Ecole des Beaux Arts and under Cabanel. He has exhibited with growing distinction, at successive salons, from that of 1860, with his "Hamlet," his "Samson" in 1872, his "Scenes from Algiers" in 1873-1874, his great historical painting of "Mohammed II. in 1453" in the Exposition of 1878, and in 1885 a large Oriental subject, as melodramatic as possible, with splendid rendering of the human figure and strong effects of color. His noble picture of "Justinian" is in the Metropolitan Art Museum, New York. He was decorated with the cross of the Legion of Honor in 1878. He died May 26, 1902.

CONSTANTINE, the ancient *Cirta*, a fortified city and bishopric, in Algeria; capital of the department of Constantine (of which the other chief towns are Philippeville and Bona on the coast, Setif and El Wad in the interior); on a detached rocky height, surrounded on three sides by ravines, crossed in one place by a Roman bridge, elsewhere by four natural bridges. At the bottom of the ravines flows the Wad Rummel. The city has Roman remains, and a citadel on the site of the ancient Numidian fortress, rising 300 feet above the

level of the rock. It manufactures saddlery and leather goods, and exports corn to Tunis. It was taken by the French, Oct. 13, 1837, after two memorable sieges.

CONSTANTINE, CAIUS FLAVIUS VALERIUS AURELIUS CLAUDIUS, a Roman emperor, surnamed the Great; son of the Emperor Constantine Chlorus; born 274 A. D. After the death of his father he was chosen emperor by the soldiery, in the year 306, and took possession of the countries which had been subject to his father, namely, Gaul, Spain, and Britain. He defeated the Franks who had obtained a footing in Gaul and drove them across the Rhine; and then directed his arms against Maxentius, who had joined Maximian against him. In the campaign in Italy he saw, it is said, the vision of a flaming cross in the heavens, bearing the inscription, "*In hoc signo vinces.*" Under the standard of the cross, therefore, he vanquished the army of Maxentius under the walls of Rome, and entered the city in triumph. In 313, together with his son-in-law, the Eastern emperor, Licinius, he published the memorable edict of toleration in favor of the Christians, and subsequently declared Christianity the religion of the state. Licinius twice took up arms against him, but was on each occasion defeated, and finally put to death. Thus in 325 Constantine became the sole head of the Roman Empire. His internal administration was marked by a wise spirit of reform, and by many humane concessions with regard to slaves, etc. In 329 he laid the foundation of a new capital of the empire, at Byzantium, which was called after him Constantinople, and soon rivaled Rome herself. In 332 he fought successfully against the Goths, relieving the empire of a tribute previously paid the barbarians. In 337 he was taken ill near Nicomedia, was baptized, and died after a reign of 31 years, leaving his empire between his three sons, Constantine, Constantius, and Constans.

CONSTANTINE II., called the younger, eldest son of the above, received, as his share of the empire, on the death of his father, Gaul, Spain, and Britain. Being desirous, however, of possessing himself of the territory of his brother Constans, he was killed in Italy, in 340.

CONSTANTINE III. (Novus), born in 612 A. D.; died in 641.

CONSTANTINE IV., Emperor of the East, surnamed Pogonatus, or the Bearded, was son of Constans II., whom he succeeded in 668. His two brothers, Tiberius and Heraclius, shared the title of Augustus, but had little or no share in the government, and toward the close of his reign, Constantine IV., under the influence of suspicion, had them put to death. Constantinople was unsuccessfully attacked by the Mussulmans in 672-678. During these wars the famous "Greek fire" was invented. Constantine died in 685.

CONSTANTINE V., Emperor of the East, succeeded his father, Leo the Isaurian, in 743. He sided with the Iconoclasts, who hurled down the images of the saints, and persecuted the followers of the Roman Catholic Church. He died in an expedition against the Bulgarians in 775.

CONSTANTINE VI., Emperor of the East, was the son of Leo IV., whom he succeeded in 780. Being only 10 years old when his father died, his mother Irene was his guardian and regent of the empire. After arriving at the mature age he wished to assume the government himself; but Irene had him imprisoned. He escaped in 790, exiled his mother, recalled her, and, finally, ruined by his licentious living, and despised by his subjects, a conspiracy was formed against him, Irene leading; and being imprisoned, his eyes were put out by her orders. The blind prince died in 797.

CONSTANTINE VII., was named emperor in 868, during the lifetime of his father, Basilius I., but died in 878.

CONSTANTINE VIII., surnamed *Porphyrogenitus*, Emperor of the East, succeeded Leo the Wise in 905. He was destitute of energy, and devoted himself chiefly to study. He admitted colleagues to the throne, so that at last five emperors were reigning together. Constantine VIII. left a treatise on state affairs, a geography of the empire, and the "Life of the Emperor Basilius, the Macedonian." He died in 959.

CONSTANTINE IX., son of Romanus I., reigned with his father and two brothers, from 919 to 945, during the time that Porphyrogenitus was deposed.

CONSTANTINE X., son of Romanus II., succeeded John Zemisces, and was proclaimed emperor of the East, with his brother, Basilius II., who held the principal authority till 1025, when he died. Constantine X. was, after that, sole emperor. He died in 1028.

CONSTANTINE XI., surnamed the Gladiator, obtained the empire in 1042, having married the Empress Zoe, widow of Romanus III. This prince is known

alone for his debaucheries. He allowed the Turks to increase their territories at his expense, and to establish themselves in Persia.

CONSTANTINE XII., surnamed Ducas, succeeded, in 1059, Isaac Comnenus, who had adopted him. In his reign the Scythians ravaged the empire, and some cities were destroyed by earthquakes. He died in 1067.

CONSTANTINE XIII., the last of the Greek emperors, succeeded to the throne in 1448. He was killed in bravely defending Constantinople against Mahomet II., who in 1453 besieged the city with 300,000 men. Constantine displayed great valor, but the city was taken and thus ended the Greek empire.

CONSTANTINE, FLAVIUS JULIUS, a private soldier, who was raised by the army in Britain to the imperial dignity in 409, on which he crossed over to Gaul, and conquered that country and Spain. He fixed his court at Arles, where he was besieged by Constantius, the general of the Emperor Honorius, to whom he surrendered on the promise that his life would be spared; but it was basely violated, and both Constantine and his son were put to death, 411 A. D.

CONSTANTINE I., King of Greece, born in Athens, eldest son of King George I. and Olga, daughter of the Russian Grand-Duke Constantine Nikolayevitch, and niece of the Russian Czar, Nicholas I. He was reared in the Greek Orthodox faith and educated in Germany, at Leipzig and Berlin. In 1889 he married Princess Sophia, sister of Emperor William II. of Germany. In 1897 he took command in the field of the Greek armies engaged in the war against Turkey, with the result that he was held largely responsible for the disasters which befell the Greek forces in that campaign. In 1912-1913 he largely retrieved his military reputation by his successful operations against the Turks before Saloniki, when he was again in full command of the Greek forces. On March 9, 1913, his father, King George I., was assassinated in Saloniki, and on March 21 following Constantine ascended the throne. On the outbreak of the World War (1914) he immediately showed himself in sympathy with the Central Empires, for which reason he came into constant friction with the Allies, who had been invited by the Greek Premier, Venizelos, to land a force in Macedonia for operations against the Turks. King Constantine persisted in his pro-German policy so assiduously that finally, on June 12, 1917, under pressure from the Allies, he abdicated in favor of Prince Alexander, his second oldest son, the Crown Prince being also



CONSTANTINE I. OF GREECE

regarded as infected with his father's sympathies. He lived in retirement in Switzerland until he was recalled by a vote of the people held on Dec. 5, 1920.

CONSTANTINE I., King of Scotland from 458 to 479. Constantine II., king from 858 to 871. Constantine III., king from 903 to 943. Constantine IV., usurped the throne, and was killed by the brother of Kenneth, 1062.

CONSTANTINE, NIKOLAEVITCH, the second son of the Emperor Nicholas of Russia, and brother of the Emperor Alexander II., grand-duke and great admiral of Russia; born in St. Petersburg, Sept. 21, 1827. In the war of 1854-1856, he had the defenses of the Baltic intrusted to his care, in conjunction with Admiral Lütke; but the policy of the emperor hardly allowed the prince any display of courage or ability. He was made Viceroy of Poland in 1862. He died in St. Petersburg, Jan. 24, 1892.

CONSTANTINE TOLMEN, a great oblong stone, 33 feet long, 18 wide, and 14 thick, poised on the points of two upright rocks in Cornwall, England.

CONSTANTINOPLE ("city of Constantine"), called by the Turks STAMBOUL; a celebrated city of Turkey in Europe; capital of the Turkish empire; on a promontory jutting out into the Sea of Marmora, having the Golden Horn, an inlet of the latter, on the N. and the Bosporus on the E. The city proper is thus surrounded by water on all sides excepting the W., where is an ancient and lofty double wall 4 miles in length, stretching across the promontory. On the opposite side of the Golden Horn are Galata, Pera, and other suburbs, while on the Asiatic side of the Bosporus entrance is Skutari. Occupying the extreme point of the promontory on which the city stands is the Seraglio or palace of the Sultan, which, with its buildings, pavilions, gardens, and groves, includes a large space.

Of the 300 mosques, the most remarkable are the royal mosques, of which there are about 15, esteemed the finest in the world. First among these is the Mosque of St. Sophia, the most ancient existing Christian Church, converted into a mosque in 1453 on the capture of the city by the Turks. Another magnificent mosque is that of Soliman; after which are those of the Sultana Valide, built by the mother of Mohammed IV., and of Sultan Achmet, the most conspicuous object in the city when viewed from the Sea of Marmora.

Constantinople has but one remarkable square, called the At-Meidan, occupying the site of the ancient Hippodrome. There are about 130 public baths in the city, mostly of marble, of plain exterior, but handsome and commodious within. The few manufactures are chiefly confined to articles in morocco leather, saddlery, tobacco-pipes, fez caps, arms, perfumes, gold and silver embroideries, etc. The foreign commerce is considerable. The harbor, the Golden Horn, which more resembles a large river than a harbor, is deep, well-sheltered, and capable of containing 1,200 large ships, which may load and unload along the quays. It is about 6 miles long, and a little more than half a mile broad at the widest part. The exports consist of silk, carpets, hides, wool, goats'-hair, and valonia.

The suburb Galata is the principal seat of foreign commerce. Here are situated the arsenals, the dock-yard, and the artillery barracks, extending along the Bosporus for nearly 1½ miles. It is an ancient place. Pera occupies the more elevated portion of the promontory of which Galata forms the maritime port. Both it and Galata have now much of the appearance of a modern European town. Constantinople occupies the site of the ancient Byzantium, and was named after Constantine the Great, who rebuilt it about 330 A. D. It was taken in 1204 by the Crusaders, who retained it till 1261; and by the Turks under Mohammed II., May 29, 1453—an event which completed the extinction of the Byzantine Empire. See BYZANTINE EMPIRE and BYZANTIUM. In 1915 the British and French fleet and forces attempted to capture Constantinople by attacking in the Dardanelles, but failed. With the collapse of the empire in October, 1918, Constantinople was occupied by an Allied military commission. Pop. about 1,000,000.

CONSTANTINOPLE, STRAIT OF. See BOSPORUS.

CONSTANTIUS, CHLORUS, nephew of the emperor Claudius II., became Cæsar in 292 A. D., received Britain, Gaul, and Spain as his government, and after re-establishing Roman power in Britain and defeating the Alemanni, became one of the two Augustuses in 305, but died in York in 306. Constantine the Great was his son.—(2) Constantius, third son of Constantine, was Roman emperor, 337-361 A. D. He fought with the Persians; and after the death in 350 of his brother Constans (who in 340 had defeated their elder brother Constantine), became sole emperor till his death in 361.

CONSTELLATION, a group or configuration of stars, within certain boundaries, to which a definite name has been assigned, the name being generally expressed in its Latin for the sake of international convenience and of exactness. This grouping is almost entirely artificial, though some of the configurations bear some resemblance to the object indicated by the name.

History.—Before the invention of almanacs the risings and settings of the constellations were looked to by husbandmen, shepherds, and sea-faring men as the landmarks of the seasons, and of the weather which each season was expected to bring. The earliest description that we have of the constellations is the poem by Aratus, called "The Phenomena of Aratus," about 280 B. C. The Greek sphere used by Hipparchus, 125 B. C., appears to be the earliest known accurate representation of the positions and magnitudes of the stars, and upon this they were grouped into 48 constellations. We know of this work through the description of it in Ptolemy's "*Megale Syntaxis*," A. D. 170. This was translated by the Saracens into Arabic, A. D. 813-832, and miscalled by them the "*Almagest*," and it is principally through translations of this work that we know of these 48

original asterisms. Various astronomers have since then added a host of others, but most of these have fallen into disuse.

Lettering the Stars.—In 1603 Bayer, in his "*Uranometria*," immortalized himself by the happy thought of assigning letters to the individual stars of each of the 48 constellations of the "*Almagest*" beginning with the Greek alphabet and following approximately the order of brightness of the stars, and then using the lower-case Roman letters where needed to complete any constellation. Some confusion has arisen, especially in those extending far toward the S., in trying to identify all of Bayer's lettered stars. Argelander's "*Uranometria Nova*" is, however, accepted to-day, with a few trifling exceptions, as the correct interpretation of Bayer. Lacaille, at the Cape, 1751-1752, extended the same system to the southern constellations, and was also compelled to revise the lettering of a few of Bayer's most southern ones, which were very inaccurately delineated. As far N. as his work extended, to + 10° of declination, Dr. Gould also assigned letters in the constellations still unlettered, *Monorceros*, *Scutum*, and *Sextans*. In the northern constellations added by Hevelius, or between his time and Ptolemy, and which had not been lettered, Bailey assigned a few Greek letters when publishing the "*B. A. C.*" (*British Association Catalogue*) in 1845. These letters will probably stand in any future revision of the northern heavens, though they are not very generally used by astronomers to-day. It should also be noted that the last letters of the capital Roman alphabet, beginning with R, are reserved for the variable stars. This has been agreed upon since Argelander's time, and has compelled the abandonment of several such letters assigned by Lacaille in the southern heavens to stars that are not variables. Flamsteed's numbers in each constellation of the stars observed by him are also extensively used as a system of naming individual stars. These numbers refer to the order in which the stars occur in each constellation in his "*Catalogus Britannicus*." Other early catalogues of stars arranged in this way by constellations are often used as a means of naming individual stars, especially that of Hevelius, a capital H being used in this case. These numbers refer, not to the arrangement of the stars in Hevelius's original "*Prodomus Astronomiæ*" (1690), nor to Bailey's edition of it in the 13th volume of the "Memoirs of the Royal Astronomical Society," but to Flamsteed's edition of the catalogue as published in the third volume of the "*Historia Cælestis Britannica*," London, 1725, and considerable confusion has at times arisen from ignorance of this fact.

CONSTIPATION, an undue retention of the fæces or their imperfect evacuation. When the morbid affection is but slight it is of little moment. In most cases, however, there is headache, more rarely vertigo; while if the disease be protracted and severe, colic, hæmorrhoids, cutaneous eruptions, hysteria, epilepsy, or even ileus or enteritis, the last two fatal diseases, may be the result.

CONSTITUENT ASSEMBLY, a name given to the first convention of the delegates of the French nation (1787-1791) to distinguish it from the legislative assembly of 1791. It drew up and obtained the acceptance of the first of the famous revolutionary constitutions. The Constituent Assembly of 1848 had a similar aim.

CONSTITUTION, the organic law, written or unwritten, of a body politic, though the word is used popularly with great vagueness. The natives of England speak with pride of the British "constitution." Each of the United States of America has a "constitution," while the Federal "constitution" holds them all together. During the democratic uprising in Continental Europe in 1848, the people in each country demanded that their despotic sovereigns should grant them a "constitution." In all these cases the constitution is an organization of the great body politic with regard to such fundamental matters as legislative, executive, and judicial power and authority. In the uprisings in 1848, the constitution sought was an instrument having the force of solemn compact, by which the despot, who had hitherto ruled alone, or nearly alone, gave a substantial share of his power to his subjects, so as to render them in a manner self-governed. In the United States, whether the State in point was founded before or after the War of Independence, it was an engagement between the different portions of society as to the political powers which they should respectively exercise. In the British constitution it is the complex political organization which has grown up during the many centuries that the British people have existed, and which consequently has a stability and an adaptation to all classes.

One reason of the successful working of the American and the British constitutions has been their mixed character. No class of men are morally capable of wielding supreme power with-

out abusing it. A Nero, a Caligula, a Tiberius, and a multitude of other emperors, show what uncontrolled royal power can do. By the State and National Constitutions of the United States the legislative power is vested in the National and State legislatures; the executive power in the President and governors, both of whom are elected and removed at frequent intervals. The judiciary interpret the law, and are in turn restrained by written statutes and prescription. The rights of the people are guarded by the habeas corpus act, and by the further constitutional guarantees of both the State and National charters. The jury trial stands as a bar to malicious persecution. Should an exigency arise necessitating a change in the Constitution of the State or of the nation, the change must be submitted to the people and ratified by them.

The Constitution of the United States as it now stands consists of 7 original articles and 19 articles of amendment, the last two being those providing for the prohibition of intoxicating liquors and for woman suffrage. It was originally framed by the representatives of the people, who met at Philadelphia, and finally adopted it on Sept. 17, 1787. It became a law of the land on the first Wednesday of March, 1789. In the British constitution legislative power is placed in the hands of the king, lords, and the commons; the executive power is nominally in the hands of the sovereign, but really in those of responsible ministers. The judicial authority is vested in judges, not removable except for very serious fault; while the jury system affords a guarantee that no one can be pronounced guilty unless 12 of his peers see their way to convicting him of the offense. Nor can one be imprisoned for an indefinite period without being brought to trial; for a writ of habeas corpus may be applied for, which requires the individual to be produced for trial within a certain time, or released. These fundamental arrangements are not like the changeless laws of nature. A constitution made directly or indirectly by men may be altered by men, and, in exceptional circumstances, when parts of the constitution are systematically abused to the detriment of society, society, speaking by its mouthpiece, the Legislature, can meet the crisis by enacting that they shall be temporarily suspended or permanently repealed.

Apostolic Constitutions are ordinances for the discipline of the Church, particularly the apostolic constitutions and a collection of regulations attributed to the Apostles, and supposed to have been collected by St. Clement, whose name they bear. Their authenticity has been greatly questioned.

In Scots Law, a decree of constitution is a decree by which the extent of a debt or obligation is ascertained. The term is generally applied to those decrees which are requisite to found a title in the person of the creditor in the event of the death of the debtor of the original creditor.

The Constitutions of Clarendon are constitutions, in the sense of laws or regulations, made at a Council held at Clarendon, near Salisbury, on Jan. 25, 1164. They were designed to define the boundary-line between civil and ecclesiastical jurisdiction, and did so in a sense favorable to the civil power. On this account Thomas à Becket, Archbishop of Canterbury, refused to sign them, and excommunicated many of the ecclesiastics who had done so. This led to the feud between him and the civil government, which ultimately caused his assassination on Dec. 29, 1170.

CONSTITUTION OF THE UNITED STATES.—We, the people of the United States, in order to form a more perfect Union, establish justice, insure domestic tranquillity, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America.

ARTICLE I.

SECTION I. All legislative powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives.

SECTION II. 1. The House of Representatives shall be composed of members chosen every second year by the people of the several States, and the electors in each State shall have the qualifications requisite for electors of the most numerous branch of the State Legislature.

2. No person shall be a Representative who shall not have attained to the age of 25 years, and been seven years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State in which he shall be chosen.

3. Representatives and direct taxes shall be apportioned among the several States which may be included within this Union according to their respective numbers, which shall be determined by adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, three-fifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of 10 years, in such manner as they shall by law direct. The number of Representatives shall not exceed one for every 30,000, but each State shall have at least one Representative; and until such enumeration shall be made, the State of New Hampshire shall be entitled to choose 3; Massachusetts, 8; Rhode Island and Providence Plantations, 1; Connecticut, 5; New York, 6; New Jersey, 4; Pennsylvania, 8; Delaware, 1; Maryland, 6; Virginia, 10; North Carolina, 5; South Carolina, 5, and Georgia, 3.

4. When vacancies happen in the representation from any State, the Executive Authority thereof shall issue writs of election to fill such vacancies.

5. The House of Representatives shall choose their Speaker and other officers, and shall have the sole power of impeachment.

SECTION III. 1. The Senate of the United States shall be composed of two Senators from each State, chosen by the Legislature thereof, for six years; and each Senator shall have one vote.

2. Immediately after they shall be assembled in consequence of the first election, they shall be divided as equally as may be into three classes. The seats of the Senators of the first class shall be vacated at the expiration of the second year, of the second class at the expiration of the fourth year, and of the third class at the expiration of the sixth year, so that one-third may be chosen every second year; and if vacancies happen by resignation, or otherwise, during the recess of the Legislature of any State, the Executive thereof may make temporary appointment until the next meeting of the Legislature, which shall then fill such vacancies.

3. No person shall be a Senator who shall not have attained to the age of 30 years, and been nine years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State for which he shall be chosen.

4. The Vice-President of the United States shall be President of the Senate, but shall have no vote unless they be equally divided.

5. The Senate shall choose their officers, also a president *pro tempore*, in the absence of the Vice-President, or when he shall exercise the office of President of the United States.

6. The Senate shall have the sole power to try all impeachments. When sitting for that purpose, they shall be on oath or affirmation. When the President of the United States is tried, the Chief-Justice shall preside; and no person shall be convicted without the concurrence of two-thirds of the members present.

7. Judgment in cases of impeachment shall not extend further than to remove from office, and disqualification to hold and enjoy any office of honor, trust, or profit under the United States; but the party convicted shall nevertheless be liable and subject to indictment, trial, judgment, and punishment, according to law.

SECTION IV. 1. The times, places, and manner of holding elections for Senators and Representatives shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by law make or alter such regulations, except as to places of choosing Senators.

2. The Congress shall assemble at least once in every year, and such meeting shall be on the first Monday in December, unless they shall by law appoint a different day.

SECTION V. 1. Each House shall be the judge of the elections, returns, and qualifications of its own members, and a majority of each shall constitute a quorum to do business; but a smaller number may adjourn from day to day, and may be authorized to compel the attendance of absent members in such manner and under such penalties as each House may provide.

2. Each House may determine the rules of its proceedings, punish its members for disorderly behavior, and with the concurrence of two-thirds expel a member.

3. Each House shall keep a journal of its proceedings, and from time to time publish the same, excepting such parts as may in their judgment require secrecy; and the yeas and nays of the members of either House on any question shall, at the desire of one-fifth of those present, be entered on the journal.

4. Neither House, during the session of Congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two Houses shall be sitting.

SECTION VI. 1. The Senators and Representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the Treasury of the United States. They shall in all cases, except treason, felony, and breach of the peace, be privileged from arrest during their attendance at the session of their respective Houses, and in going to and returning from the same; and for any speech or debate in either House they shall not be questioned in any other place.

2. No Senator or Representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States which shall have been created, or the emoluments whereof shall have been increased during such time; and no person holding any office under the United States shall be a member of either House during his continuance in office.

SECTION VII. 1. All bills for raising revenue shall originate in the House of Representatives, but the Senate may propose or concur with amendments, as on other bills.

2. Every bill which shall have passed the House of Representatives and the Senate shall, before it become a law, be presented to the President of the United States; if he approve, he shall sign it, but if not, he shall return it, with his objections, to that House in which it shall have originated, who shall enter the objections at large on their journal, and proceed to reconsider it. If after such reconsideration two-thirds of that House shall agree to pass the bill, it shall be sent, together with the objections, to the other House, by which it shall likewise be reconsidered; and if approved by two-thirds of that House it shall become a law. But in all such cases the votes of both Houses shall be determined by yeas and nays, and the names of the persons voting for and against the bill shall be entered on the journal of each House respectively. If any bill shall not be returned by the President within 10 days (Sundays excepted) after it shall have been presented to him, the same shall be a law in like manner as if he had signed it, unless the Congress by their adjournment prevent its return; in which case it shall not be a law.

3. Every order, resolution, or vote to which the concurrence of the Senate and House of Representatives may be necessary (except on a question of adjournment) shall be presented to the President of the United States; and before the same shall take effect shall be approved by him, or being disapproved by him, shall be repassed by two-thirds of the Senate and the House of Representatives, according to the rules and limitations prescribed in the case of a bill.

SECTION VIII. 1. The Congress shall have power:

To lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defense and general welfare of the United States; but all duties, imposts, and excises shall be uniform throughout the United States.

2. To borrow money on the credit of the United States.

3. To regulate commerce with foreign nations and among the several States, and with the Indian tribes.

4. To establish an uniform rule of naturalization and uniform laws on the subject of bankruptcies throughout the United States.

5. To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures.

6. To provide for the punishment of counterfeiting the securities and current coin of the United States.

7. To establish postoffices and postroads.

8. To promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

9. To constitute tribunals inferior to the Supreme Court.

10. To define and punish piracies and

felonies committed on the high seas, and offenses against the law of nations.

11. To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water.

12. To raise and support armies, but no appropriation of money to that use shall be for a longer term than two years.

13. To provide and maintain a navy.

14. To make rules for the government and regulation of the land and naval forces.

15. To provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions.

16. To provide for organizing, arming, and disciplining the militia, and for governing such part of them as may be employed in the service of the United States, reserving to the States respectively the appointment of the officers, and the authority of training the militia according to the discipline prescribed by Congress.

17. To exercise exclusive legislation in all cases whatsoever over such district (not exceeding 10 miles square) as may, by cession of particular States and the acceptance of Congress, become the seat of the Government of the United States, and to exercise like authority over all places purchased by the consent of the Legislature of the State in which the same shall be, for the erection of forts, magazines, arsenals, dockyards, and other needful buildings. And

18. To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the Government of the United States, or in any department or officer thereof.

SECTION IX. 1. The migration or importation of such persons as any of the States now existing shall think proper to admit shall not be prohibited by the Congress prior to the year one thousand eight hundred and eight, but a tax or duty may be imposed on such importation, not exceeding 10 dollars for each person.

2. The privilege of the writ of habeas corpus shall not be suspended, unless when in cases of rebellion or invasion the public safety may require it.

3. No bill of attainder or *ex post facto* law shall be passed.

4. No capitation or other direct tax shall be laid, unless in proportion to the census or enumeration hereinbefore directed to be taken.

5. No tax or duty shall be laid on articles exported from any State.

6. No preference shall be given by any regulation of commerce or revenue to the ports of one State over those of another, nor shall vessels bound to or from one State be obliged to enter, clear, or pay duties in another.

7. No money shall be drawn from the Treasury but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

8. No title of nobility shall be granted by the United States. And no person holding any office of profit or trust under them shall, without the consent of the Congress, accept of any present, emolument, office, or title of any kind whatever from any king, prince, or foreign state.

SECTION X. 1. No State shall enter into any treaty, alliance, or confederation, grant letters of marque and reprisal, coin money, emit bills of credit, make anything but gold and silver coin a tender in payment of debts, pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts, or grant any title of nobility.

2. No State shall, without the consent of the Congress, lay any impost or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts, laid by any State on imports or exports, shall be for the use of the Treasury of the United States; and all such laws shall be subject to the revision and control of the Congress.

3. No State shall, without the consent of Congress, lay any duty of tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another State, or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay.

ARTICLE II.

SECTION I. 1. The executive power shall be vested in a President of the United States of America. He shall hold his office during the term of four years, and, together with the Vice-President, chosen for the same term, be elected as follows:

2. Each State shall appoint, in such manner as the Legislature thereof may direct, a number of electors, equal to the whole number of Senators and Representatives to which the State may be entitled in the Congress; but no Senator or Representative or person holding an office of trust or profit under the United States shall be appointed an elector.

3. [The electors shall meet in their respective States and vote by ballot for two persons, of whom one at least shall not be an inhabitant of the same State with themselves. And they shall make a list of all the persons voted for, and of the number of votes for each, which list they shall sign and certify and transmit, sealed, to the seat of the government of the United States, directed to the President of the Senate. The President of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates, and the votes shall then be counted. The person having the greatest number of votes shall be the President, if such number be a majority of the whole number of electors appointed, and if there be more than one who have such majority, and have an equal number of votes, then the House of Representatives shall immediately choose by ballot one of them for President; and if no person have a majority, then from the five highest on the list the said House shall in like manner choose the President. But in choosing the President, the votes shall be taken by States, the representation from each State having one vote. A quorum, for this purpose, shall consist of a member or members from two-thirds of the States, and a majority of all the States shall be necessary to a choice. In every case, after the choice of the President, the person having the greatest number of votes of the electors shall be the Vice-President. But if there should remain two or more who have equal votes, the Senate shall choose from them by ballot the Vice-President.]

4. The Congress may determine the time of choosing the electors and the day on which they shall give their votes, which day shall be the same throughout the United States.

5. No person except a natural born citizen, or a citizen of the United States at the time of the adoption of this Constitution, shall be eligible to the office of President; neither shall any person be eligible to that office who shall not have attained to the age of 35 years and been 14 years a resident within the United States.

6. In case of the removal of the President from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the Vice-President, and the Congress may by law provide for the case of removal, death, resignation, or inability, both of the President and Vice-President, declaring what officer shall then act as President, and such officer shall act accordingly until the disability be removed or a President shall be elected.

7. The President shall, at stated times, receive for his services a compensation, which shall neither be increased nor diminished during the period for which he shall have been elected, and he shall not receive within that period any

other emolument from the United States, or any of them.

8. Before he enter on the execution of his office he shall take the following oath or affirmation:

"I do solemnly swear (or affirm) that I will faithfully execute the office of President of the United States, and will, to the best of my ability, preserve, protect, and defend the Constitution of the United States."

SECTION II. 1. The President shall be Commander-in-Chief of the Army and Navy of the United States, and of the militia of the several States when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive departments upon any subject relating to the duties of their respective offices, and he shall have power to grant reprieves and pardons for offenses against the United States except in cases of impeachment.

2. He shall have power, by and with the advice and consent of the Senate, to make treaties, provided two-thirds of the Senators present concur; and he shall nominate, and by and with the advice and consent of the Senate shall appoint ambassadors, other public ministers and consuls, judges of the Supreme Court, and all other officers of the United States whose appointments are not herein otherwise provided for, and which shall be established by law; but the Congress may by law vest the appointment of such inferior officers as they think proper in the President alone, in the courts of law, or in the heads of departments.

3. The President shall have power to fill up all vacancies that may happen during the recess of the Senate by granting commissions, which shall expire at the end of their next session.

SECTION III. He shall from time to time give to the Congress information of the state of the Union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may, on extraordinary occasions, convene both Houses, or either of them, and in case of disagreement between them with respect to the time of adjournment, he may adjourn them to such time as he shall think proper; he shall receive ambassadors and other public ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States.

SECTION IV. The President, Vice-President, and all civil officers of the United States shall be removed from office on impeachment for and conviction of treason, bribery, or other high crimes and misdemeanors.

ARTICLE III.

SECTION I. The judicial power of the United States shall be vested in one Supreme Court, and in such inferior courts as the Congress may from time to time ordain and establish. The judges, both of the Supreme and inferior courts, shall hold their offices during good behavior, and shall at stated times receive for their services a compensation which shall not be diminished during their continuance in office.

SECTION II. 1. The judicial power shall extend to all cases in law and equity arising under this Constitution, the laws of the United States, and treaties made, or which shall be made, under their authority; to all cases affecting ambassadors, other public ministers, and consuls; to all cases of admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more States, between a State and citizens of another State, between citizens of different States, between citizens of the same State claiming lands under grants of different States, and between a State, or the citizens thereof, and foreign States, citizens or subjects.

2. In all cases affecting ambassadors, other public ministers, and consuls, and those in which a State shall be party, the Supreme Court shall have original jurisdiction. In all the other cases before-mentioned the Supreme Court shall have appellate jurisdiction both as to law and fact, with such exceptions and under such regulations as the Congress shall make.

3. The trial of all crimes, except in cases of impeachment, shall be by jury, and such trial shall be held in the State where the said crimes shall have been committed; but when not committed within any State the trial shall be at such place or places as the Congress may by law have directed.

SECTION III. 1. Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort. No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court.

2. The Congress shall have power to declare the punishment of treason, but no attainder of treason shall work corruption of blood or forfeiture except during the life of the person attainted.

ARTICLE IV.

SECTION I. Full faith and credit shall be given in each State to the public acts, records, and judicial proceedings of every other State. And the Congress may by general laws prescribe the manner in which such acts, records, and proceedings shall be proved, and the effect thereof.

SECTION II. 1. The citizens of each State shall be entitled to all privileges and immunities of citizens in the several States.

2. A person charged in any State with treason, felony, or other crime, who shall flee from justice, and be found in another State, shall, on demand of the Executive authority of the State from which he fled, be delivered up, to be removed to the State having jurisdiction of the crime.

3. No person held to service or labor in one State, under the laws thereof, escaping into another shall, in consequence of any law or regulation therein, be discharged from such service or labor, but shall be delivered up on claim of the party to whom such service or labor may be due.

SECTION III. 1. New States may be admitted by the Congress into this Union; but no new State shall be formed or erected within the jurisdiction of any other State, nor any State be formed by the junction of two or more States, or parts of States, without the consent of the Legislatures of the States concerned, as well as of the Congress.

2. The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any claims of the United States, or of any particular State.

SECTION IV. The United States shall guarantee to every State in this Union a republican form of government, and shall protect each of them against invasion, and, on application of the Legislature, or of the Executive (when the Legislature cannot be convened), against domestic violence.

ARTICLE V.

The Congress, whenever two-thirds of both Houses shall deem it necessary, shall propose amendments to this Constitution, or, on the application of the Legislatures of two-thirds of the several States, shall call a convention for proposing amendments, which, in either case, shall be valid to all intents and purposes, as part of this Constitution, when ratified by the Legislatures of three-fourths of the several States, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the Congress; provided that no amendment which may be made prior to the year one thousand eight hundred and eight shall in any manner affect the first and fourth clauses in the Ninth Section of the First Article; and that no State, without its consent,

shall be deprived of its equal suffrage in the Senate.

ARTICLE VI.

1. All debts contracted and engagements entered into before the adoption of this Constitution shall be as valid against the United States under this Constitution as under the Confederation.

2. This Constitution and the laws of the United States which shall be made in pursuance thereof and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every State shall be bound thereby, anything in the Constitution or laws of any State to the contrary notwithstanding.

3. The Senators and Representatives before mentioned, and the members of the several State Legislatures, and all executive and judicial officers, both of the United States and of the several States, shall be bound by oath or affirmation to support this Constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

ARTICLE VII.

The ratification of the Conventions of nine States shall be sufficient for the establishment of this Constitution between the States so ratifying the same.

AMENDMENTS TO THE CONSTITUTION.

ARTICLE I.

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

ARTICLE II.

A well-regulated militia being necessary to the security of a free State, the right of the people to keep and bear arms shall not be infringed.

ARTICLE III.

No soldier shall, in time of peace, be quartered in any house without the consent of the owner, nor in time of war but in a manner to be prescribed by law.

ARTICLE IV.

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

ARTICLE V.

No person shall be held to answer for a capital or other infamous crime unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service, in time of war or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.

ARTICLE VI.

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.

ARTICLE VII.

In suits at common law, where the value in controversy shall exceed 20 dollars, the right of trial by jury shall be preserved, and no fact tried by a jury shall be otherwise re-examined in any court of the United States than according to the rules of the common law.

ARTICLE VIII.

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

ARTICLE IX.

The enumeration in the Constitution of certain rights shall not be construed to deny or disparage others retained by the people.

ARTICLE X.

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

ARTICLE XI.

The judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States, by citizens of another State, or by citizens or subjects of any foreign State.

ARTICLE XII.

The electors shall meet in their respective States, and vote by ballot for President and Vice-President, one of whom at least shall not be an inhabitant of the same State with themselves; they shall name in their ballots the person voted for as President, and in distinct ballots the person voted for as Vice-President; and they shall make distinct lists of all persons voted for as President, and of all persons voted for as Vice-President, and of the number of votes for each, which list they shall sign and certify, and transmit, sealed, to the seat of the government of the United States, directed to the President of the Senate; the President of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates, and the votes shall then be counted; the person having the greatest number of votes for President shall be the President, if such number be a majority of the whole number of electors appointed; and if no person have such majority, then from the persons having the highest numbers not exceeding three on the list of those voted for as President, the House of Representatives shall choose immediately, by ballot, the President. But in choosing the President, the votes shall be taken by States, the representation from each State having one vote; a quorum for this purpose shall consist of a member or members from two-thirds of the States, and a majority of all the States shall be necessary to a choice. And if the House of Representatives shall not choose a President, whenever the right of choice shall devolve upon them, before the fourth day of March next following, then the Vice-President shall act as President, as in the case of the death or other constitutional disability of the President. The person having the greatest number of votes as Vice-President shall be the Vice-President, if such number be a majority of the whole number of electors appointed, and if no person have a majority, then from the two highest numbers on the list the Senate shall choose the Vice-President; a quorum for the purpose shall consist of two-thirds of the whole number of Senators, and a majority of the whole number shall be necessary to a choice. But no person constitutionally ineligible to the office of President shall be eligible to that of Vice-President of the United States.

ARTICLE XIII.

1. Neither slavery nor involuntary servitude, except as a punishment for crime whereof the party shall have been duly convicted, shall exist within the United States, or any place subject to their jurisdiction.

2. Congress shall have power to enforce this article by appropriate legislation.

ARTICLE XIV.

1. All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws.

2. Representatives shall be apportioned among the several States according to their respective numbers, counting the whole number of persons in each State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice-President of the United States, Representatives in Congress, the executive and judicial officers of a State, or the members of the Legislature thereof, is denied to any of the male members of such State, being of 21 years of age, and citizens of the United States, or in any way abridged, except for participation in rebellion or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens 21 years of age in such State.

3. No person shall be a Senator or Representative in Congress, or elector of President and Vice-President, or hold any office, civil or military, under the United States, or under any State, who, having previously taken an oath, as a member of Congress, or as an officer of the United States, or as a member of any State Legislature, or as an executive or judicial officer of any State, to support the Constitution of the United States, shall have engaged in insurrection or rebellion against the same, or given aid and comfort to the enemies thereof. But Congress may, by a vote of two-thirds of each House, remove such disability.

4. The validity of the public debt of the United States, authorized by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection and rebellion, shall not be questioned. But neither the United States nor any State shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations, and claims shall be held illegal and void.

5. The Congress shall have power to enforce by appropriate legislation the provisions of this article.

ARTICLE XV.

1. The right of the citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of race, color, or previous condition of servitude.

2. The Congress shall have power to enforce the provisions of this article by appropriate legislation.

Adoption.—On Sept. 28, 1787, in Constitutional Convention, in Philadelphia, the "Constitution of the United States" was adopted. The convention had given four months to its consideration. In its final preparation it was assigned to a committee consisting of Governeur Morris, of Pennsylvania; William S. Johnson, of Connecticut; Alexander Hamilton, of New York; James Madison, of Virginia; and Rufus King, of Massachusetts. In this committee, by common consent, the work was intrusted mainly to Morris, who wrote out the entire document. With some minor changes the work was adopted by the convention as written, and sent out to the several States at the above date, for ratification.

Ratification of Constitution. — The Constitution was ratified by the 13 original States in the following order:

Delaware, Dec. 7, 1787, unanimously.

Pennsylvania, Dec. 12, 1787, vote 46 to 23.

New Jersey, Dec. 18, 1787, unanimously.

Georgia, Jan. 2, 1788, unanimously.

Connecticut, Jan. 9, 1788, vote 128 to 40.

Massachusetts, Feb. 6, 1788, vote 187 to 168.

Maryland, April 28, 1788, vote 63 to 12.

South Carolina, May 28, 1788, vote 149 to 73.

New Hampshire, June 21, 1788, vote 57 to 46.

Virginia, June 25, 1788, vote 89 to 79.

New York, July 26, 1788, vote 30 to 28.

North Carolina, Nov. 21, 1789, vote 193 to 75.

Rhode Island, May 29, 1790, vote 34 to 32.

Ratification of Amendments.—

I. to X. inclusive were declared in force Dec. 15, 1791.

XI. was declared in force Jan. 8, 1798.

XII., regulating elections, was ratified by all the States except Connecticut, Delaware, Massachusetts and New Hampshire, which rejected it. It was declared in force Sept. 28, 1804.

XIII. The emancipation amendment was ratified by 31 of the 36 States; rejected by Delaware and Kentucky, not acted on by Texas; conditionally ratified by Alabama and Mississippi. Proclaimed Dec. 18, 1865.

XIV. Reconstruction amendment was ratified by 23 Northern States; rejected by Delaware, Kentucky, Maryland, and 10 Southern States, and not acted on by California. The 10 Southern States subsequently ratified it. Proclaimed July 28, 1866.

XV. Negro citizenship amendment was not acted on by Tennessee, rejected by California, Delaware, Kentucky, Maryland, New Jersey, and Oregon; ratified by the remaining 30 States. New York rescinded its ratification Jan. 5, 1870. Proclaimed March 30, 1870.

XVI. A taxation amendment; its purpose being to obviate the requirement of distributing direct taxes among States according to their respective populations. Passed both Houses in 1909. Declared in force Feb. 25, 1913.

XVII. Providing for the direct elec-

tion of United States Senators. Effective May 31, 1913.

XVIII. An amendment providing for national prohibition submitted to the States for ratification was passed in December, 1917. In January, 1919, 36 States having ratified, the amendment was declared in force Jan. 1, 1920.

XIX. The Woman Suffrage amendment passed both Houses in May and June, 1919, for ratification of the States. Aug. 18, 1920, Tennessee, the 36th State, ratified the amendment for inclusion in the Federal Constitution.

CONSTITUTIONAL CONVENTION, in the United States, an assembly of delegates elected by popular vote to prepare or revise the constitution of a State. The 13 original States were admitted into the Union by the act of ratifying the Federal Constitution of 1787; the others have been received after the passage of enabling acts by Congress, and the approval by it of drafts of proposed constitutions. The first duty of a territorial candidate for statehood after the adoption of its enabling act is to call a Constitutional Convention and prepare a constitution, which must conform to the provisions of the Federal Constitution and amendments, and to the spirit of subsequent legislation by Congress. On the filing in Washington of a certificate of adoption of a constitution by the popular vote of the people in the territory, the President of the United States issues a proclamation announcing the admission of the territory into the Union as a State. Subsequently, if deemed necessary or advantageous, the Legislature may authorize a Constitutional Convention for the purpose of revising the Constitution. At the close of the Civil War each of the States formerly in the Confederacy was obliged to hold a Constitutional Convention to prepare a new constitution, recognizing the amendments to the Federal Constitution that had been adopted by the Northern States as a consequence of the war, with those portions of national legislation which were designed to be general in their application.

CONSUL, two supreme magistrates, with equal authority, elected annually in ancient Rome from the time of the expulsion of the Kings and the commencement of the Republic (A. U. C. 244; 509 B. C.) They were called at first *prætors* (prætors), *imperatores* (commanders), and *judices* (judges); but ultimately the name *consules* (consuls) prevailed over these designations. The annual meeting or assembly of the Roman citizens for their election was called by the plural term *comitia*, from the comitium, a place in or near the forum, where the elections were held. They continued, with a few exceptional elections, during the whole period of the republic, and were so important in the State that the successive years were distinguished by the consuls who had held office during each of them. At first none but patricians could hold the dignity, but 366 B. C. a plebeian was elected one of the consuls, and in 172 B. C. two. The consulate nominally continued under the empire, but was little more than a titular dignity. Tiberius transferred the power of electing consuls from the people to the Senate. Afterward their number was augmented. The last consul at Rome was Decimus Theodorus Paulinus in 536 A. D.; the last at Constantinople, Basilius junior in 541 A. D.

In French history, a consul was one of three supreme magistrates designated first, second, and third consul, who held office between 1799 and 1804. Napoleon Bonaparte was the first consul, and his power soon absorbed that of the rest.

In commerce, a consul is an officer appointed by the government of his country to reside in a specified foreign land, with the view of promoting the mercantile interests of the nation in whose service he is engaged. He annually or more frequently reports to his government the state of commerce in the region where his opportunities of observation lie. The office of consul in this sense seems to have arisen in Italy about the middle of the 12th century, and by the 16th had spread over Europe.

CONSUMERS' LEAGUE, an organization of American housewives whose purpose is to exercise their joint purchasing power on merchants and manufacturers in favor of labor conditions, especially for women and children. The idea originated in England, where the Women's Co-operative Guild, composed of the women members of the co-operative store societies, play a very significant part in influencing legislation in favor of women and children workers. In 1890 the Working Women's Society, of New York City, which was interested specially in conditions of employment for women, was conducting a thorough investigation into such conditions. It then called on the consumers for support, so effectively that in January, 1891, the Consumers' League of New York was organized. The new organization immediately took up the work of the Working Women's Society, though on a much more extensive scale. It also conducted investigations into labor conditions for women and children, more especially in department stores, but instead of merely publishing

the results, set about to devise means to improve them. The organization was especially concerned about the environment of the young girls beginning to work for their livelihoods and not yet old enough to guard themselves against the evils and temptations of a big city. One of the methods employed to force the owners of department store establishments to better the conditions of their employees is the "white list." The white list is composed of the names of those establishments which observe certain conditions of wages and hours of daily labor demanded by the organization. It is printed and circulated among the members, who bind themselves to give preferential treatment to the firms on the list. Another method of enforcing its conditions on merchants employed by the Consumers' League is the "consumers' label." This label is granted for use only to those firms which; (1) comply with state legislation passed for the benefit of female labor; (2) which manufacture their goods only on their own premises, or procure their goods from manufacturers who manufacture only on their own premises; (3) which do not employ girls under sixteen years of age; (4) which limit the hours of employment to ten or under; and, finally, those which allow inspection of their establishments by representatives of the League. Many of these provisions are now enforced in New York by law, but they are all still insisted upon by the National Consumers' League in other parts of the country, this more general body having been organized in 1899, with Mrs. Florence Kelley as secretary. The influence of the Consumers' League in bettering the working conditions of women in large mercantile establishments, especially in those which cater to the trade of the ultimate consumer, can hardly be overestimated, and in many cases has been more effective than legislation.

CONSUMPTION, TUBERCULOSIS, or **PHTHISIS,** a more or less rapidly advancing process of lung-destruction, a disease characterized by emaciation, debility, cough, hectic fever, and purulent expectoration. It is caused by a germ known as the tubercle bacillus. The predisposing causes are very variable, hereditary taint, scrofulous diathesis, syphilis, smallpox, etc., exposure to fumes and dusty air in certain trades; violent passions and excess of various kinds; sudden lowering of the temperature of the body, etc. The more immediate or occasional causes are pneumonic inflammation proceeding to suppuration, catarrh, asthma, and tubercles in the lungs.

The morbid appearance most frequently to be met with on the dissection of those who die of phthisis is the existence of tubercles in the cellular substance of the lungs, most usually at the upper and back part; but, in some instances, occupying the outer part, and forming adhesions to the pleura. In some cases life has been protracted till not one-twentieth part of the lungs appeared on dissection fit for performing their function. The left lobe is oftener affected than the right. This form of the disease is known as pulmonary tuberculosis. The tubercle bacillus also affects the lymphatic glands, the bones and many other parts of the body. Removal to an equable climate or to a pure and mild air, may arrest the disease in its incipient stage. In October, 1890, Dr. Koch, of Berlin, gave to the medical world his theory of the treatment of tuberculosis by a new medicament which he styled lymph. Its composition was made known by Dr. Koch, Jan. 15, 1891. It consists of a glycerine extract, derived from the pure cultivation of tubercle bacilli, and contains besides the effective matter all the other matters soluble in 50 per cent. glycerine. The remedy does not destroy the tubercle bacilli, but rather the affected tissues. It has been tried in various tuberculous affections, including lupus, and the fluid has a distinctly specific action on tubercular processes of all kinds. No markedly successful results have been obtained from its use. There are quite a number of preparations of tuberculin now in use. See KOCH, ROBERT.

CONTAGION, the communication of a disease by contact with the person laboring under it, as distinguished from infection, used to signify its transmission by means of the air without actual personal contact with the diseased person. But sometimes the word contagion is used in both of these senses, and is divided into immediate or contactical contagion, that produced by actual contact, and mediate or remote contagion, communicated by the air.

CONTAGIOUS DISEASES, those diseases which may be contracted by the healthy from the sick, either by direct contact with an affected part, or by indirect contact through bodily excretions and exhalations.

Typical contagious diseases are Spanish influenza, diphtheria, measles, scarlet fever, mumps, smallpox, typhus fever, erysipelas, and bubonic plague.

Diseases of this class are a menace to public health, and in all civilized nations stringent methods are used to prevent their spread, and the sufferers are

usually placed in quarantine. In the United States the enactment of quarantine laws by the several States is provided in the Federal Constitution. In most States there is a State board of health which either divides the State into districts for administration, or else delegates its authority to county, township, or city officials.

Before the World War there was a well-established system of international quarantine operating under a code drawn by Sir Shenstone Baker in 1879, which was approved by the United States, Germany, Great Britain, and many other nations.

CONTI, HOUSE OF, this younger branch of the princely French house of Condé took its name from the small town of Conti, near Amiens, and sprang from Armand de Bourbon, brother of the "Great Condé"; born in 1629; died in 1666. The most remarkable member of the family was FRANÇOIS LOUIS, Prince de la Roche-sur-Yon and Conti, born in 1664. He took a brilliant part in the victories of Steinkirk and Neerwinden, and Massillon pronounced his funeral oration. He died in 1709. The last of the House of Conti was LOUIS FRANÇOIS JOSEPH, born in 1734; died in Spain in 1814.

CONTINENT, the large, unbroken tracts of land on the earth, whether altogether or entirely disconnected, are included under this name. Thus Europe and Asia together, Africa, North America, South America, and Australia, may all be thus regarded. The word is also applied to the mainland of Europe, as distinguished from the British Islands.

CONTINENT, THE DARK. See AFRICA.

CONTINENTAL, pertaining or relating to a continent; as a continental system. Belonging or relating to the mainland of Europe, in contradistinction to the islands belonging thereto, more especially Great Britain; as, a continental tour. Relating, or pertaining to, the American colonies confederated during the Revolutionary War; as, the Continental Congress.

CONTORTED STRATA, in geology, beds which are highly folded, plicated, twisted—the folds being extremely irregular, and giving rise to rapid changes in the direction and angle of inclination. Contorted strata are frequently crumpled and puckered—the fossils and pebbles which they may chance to contain being compressed, flattened, and distorted—facts which show that the beds have been subjected to great crushing and squeezing.

CONTRABAND OF WAR, articles carried by neutrals in vessels or otherwise for the assistance of an enemy in waging war. The term embraces arms, ammunition, materials for manufacturing gunpowder, armed vessels, coal for warships, provisions and money intended for the military forces, and all supplies of warlike stores or any articles required for the prosecution of the war. Articles which are not ordinarily contraband are also liable to confiscation if they belong to the owner of the contraband and are mingled with the same in the same vehicle of conveyance or in the same packages. Where a blockade of a port is declared and successfully maintained, all articles of value become practically contraband in that they are liable to seizure and confiscation if the attempt is made to carry them into the blockaded port. According to international law, these are liable to seizure and to confiscation by order of a prize court. No recompense is made to the neutral except in the case of provisions.

During the World War all the maritime powers declared contraband or conditionally contraband provisions and goods too numerous to mention. The sinking of the "W. B. Frye," laden with grain for London, called forth a protest from the United States Government, and Germany promised compensation. When Germany declared a submarine warfare on commerce, all previous laws relating to contraband were disregarded.

CONTRACT, the term usually applied to such agreements (whether express or implied) as create, or are intended to create, a legal right, and corresponding liability; such right not attaching to the possession of the subject-matter of the contract, except in equity, and that indirectly, but subsisting both in equity and law against the contracting party. The conditions essential to the legal validity of a contract relate either to the competency of the parties, the sufficiency of the consideration or inducement, the nature of the thing contracted for, the fairness of the transaction, or, lastly, to the form of agreement. First, as to the competency of the parties: The party to be sued must have been at the time of the contract of sound mind, and, unless it was for the supply of necessaries, of full age; and if a woman, she must have been unmarried, subject as to the latter condition to some exceptions established either by local custom or by the doctrines of equity. As to the sufficiency of the consideration on the part of the person suing: It must have been either future marriage since performed, or money, or

something capable of being estimated in money; or some act, whether of performance or abstinence, whereby some undoubted advantage, though not capable of being exactly valued, accrues to the party sued. The act contracted for must be neither contrary to written law, nor to public policy; and it must be beneficial to the party seeking either performance or compensation, or to some one on whose behalf he gave the consideration. There must have been neither fraud (either by concealment or misstatement) nor compulsion on the part of the plaintiff in obtaining the agreement; and fraudulent acts subsequent to the agreement having reference to it are also sufficient to deprive the guilty party of all right under it. Some circumstances are in equity considered either as conclusive evidence of fraud, or as substantive acts of coercion, which are not strictly of such a nature, and are not so deemed at law. Lastly, as to the form of the agreement: Where it relates to an interest in land of three years' duration or more, or to goods of the value of $50 or upward, unless there be earnest or delivery, or where it is an agreement as surety, or where it is upon marriage as a consideration, it must, by American law, be in writing; though the want of a written instrument may be supplied in equity by partial performance, that is, by acts evidently done in pursuance of the alleged contract.

CONTRACT LABOR LAW, an Act of Congress, passed Feb. 26, 1885, and several times amended. Previous to the passage of this law it had been the practice of large manufacturers to recruit cheap labor in the poorer countries of Europe, even to the extent of paying for the transportation of immigrant workers and their families, this charge being later subtracted from their earnings. At first the courts interpreted the provisions of the law as applying only to unskilled labor, but on March 3, 1903, the law was amended, so that it now includes skilled workers as well. Infraction of this law now bears with it a penalty of $1,000 fine for each immigrant brought into the country illegally by manufacturers or their agents, and a fine of $500 and six months' imprisonment for the master of a ship who knowingly carries immigrants contrary to the law.

CONTRALTO, in music, the highest voice of a male adult, or the lowest of a woman or a boy; called also the *Alto*, or, when possessed by a man, *Countertenor*. It is next below the treble and above the tenor, its easy range being from tenor G to treble C.

CONTRAVALLATION, LINES OF, in military language, a chain of works round a besieged place to resist the sorties of the garrison.

CONTUSION, a bruise or injury of the soft parts of the body, without breach of surface. If the skin be broken, the injury is called a contused wound. See BRUISE.

CONVALLARIA, a genus of plants, order *Liliaceæ*, tribe *Asparageæ*. The *C. majalis* is the sweet-scented Lily of the Valley. It is found in woods and coppices, especially in a light soil. There are a red-flowered and a double variety in gardens. *C. majalis* is a valuable cardiac tonic, administered in form of fluid extract or tincture. It has, to a considerable extent, superseded digitalis purpurea for heart disease, it being free, to a large degree, from many objections to which digitalis is obnoxious.

CONVENT, the fraternity or sisterhood of an abbey or priory; a community of religious persons, whether monks or nuns. At first those who withdrew to the desert lived solitarily; the gathering together into a community of all those solitaries who could be brought to tolerate the restraint of a society regulated by rule was a later movement.

In the United States, owing to religious upheavals going on in the Old World, a very large number of the religious consecrate of the Roman Catholic Church have found refuge. One of the oldest of our commonwealths, that of Maryland, was settled by the Catholics who at an early date laid the foundations of numerous convents and monasteries. As the settlements and centers of population pushed farther in every direction from the Atlantic coast, convents and nunneries were established in every large town. The term convent is here applied almost exclusively to an establishment containing a sodality of nuns, the male religiouses being denominated monks and their establishments monasteries.

It is said that the first convent in England was erected by Eadbald at Folkestone in 630, and the first in Scotland at Coldingham in 670. They were numerous during the Middle Ages. Henry VIII. suppressed them, confiscating their revenues. By the Roman Catholic Emancipation Act of 1829 their erection in the United Kingdom was prohibited, but the Act was from the first so much of a dead letter that they were established in various places. In 1875 one was opened at Bournemouth under the auspices of the Ritualist party in the Established Church.

CONVENTICLE, a small gathering for religious worship. The word was applied to the schools of Wycliffe. Afterward it was used of Dissenters from the Establishment in Queen Elizabeth's time, but it did not come into great prominence till the passing of the Uniformity Act in 1662.

CONVENTION, the act of coming together or assembling; the state of being assembled. The word convention has in the United States an association of ideas pregnant with all that is most important in our political history. The secession conventions held in the Southern States, resulted in the Civil War of 1860-1865. Several times have constitutional conventions been called—the most important being those held in the Southern States during the "Reconstruction" period. The great national political parties meet in convention to nominate candidates for President, and the same method of nomination prevails down to the smallest candidate for the lowest municipal or county office. Many conventions for miscellaneous purposes are annually held.

In English history the word is applied to an extraordinary meeting of the Houses of Lords and Commons at a time of national crisis or revolution, without being called together by the writ of the sovereign or waiting to ask his assent. The name is specially applied (*a*) to the Parliament summoned, not by the sovereign, but by Gen. Monk, which met on April 25, 1660, and restored Charles II., and (*b*) to the Parliament convened by the Prince of Orange, who at the time was not King of England. It met on Jan. 22, 1689, and bestowed the kingdom on its author and his wife, William and Mary.

In French history the word is applied to what was more fully named the National Convention, which succeeded the National Legislative Assembly on Sept. 21, 1792, and was dissolved Oct. 26, 1795. It began by abolishing royalty and proclaiming a republic.

In diplomacy, a convention is equivalent to a treaty. Thus there have been conventions by the United States with the leading nations of the world to secure uniform and reciprocal action for special purposes.

CONVERSE, FLORENCE, an American writer, born in New Orleans in 1871. She graduated from Wellesley College in 1893. From 1908 she was a member of the staff of the "Atlantic Monthly." Her novels include "The Burden of Christopher" (1900); "The House of Prayer" (1908); "The Children of Light" (1912). She also wrote "The Story of Wellesley" (1915) and "The Blessed Birthday," a play (1917).

CONVERSE, FREDERICK SHEPHERD, an American composer, born in Newton, Mass., in 1871. He graduated from Harvard University in 1893. After studying music in Munich, he became instructor of harmony at the New England Conservatory of Music. From 1904 to 1907 he was assistant professor of music at Harvard University. He composed many songs and other musical works, including "The Pipe of Desire," an opera; "Job," an opera; and many cantatas, tone poems, and other musical work. He was one of the best known of American composers.

CONVICT LABOR, the employment of convicts in the production of useful commodities as a means of lessening the cost of prison administration and for the moral betterment of the convicts. This has been accomplished through various systems, the first of which, in point of time, is the "lease system," still employed in many Southern States. Here convicts are directly turned over to private contractors or employers, and practically the whole responsibility devolves on them. Many abuses have been the result, convicts being often retained in a condition of chattel slavery long after the expiration of their terms, in many cases imposed on them for trivial offenses. This system is now universally condemned and is fast going out of practice. Instead the "public account" system is being adopted by an ever-growing number of States. Here the labor is performed on State premises and the prison authorities are in full control. In some of the States the commodities manufactured are sold on the open, competitive market. This method has aroused considerable opposition from organized labor. In other States only such commodities are manufactured which can be used in other departments of the Government. This plan is especially favored by the national Commission on Prisons and Prison Labor. In several States, as in New Jersey, the convicts are paid regular wages, which they may collect at the expiration of their terms. In 1920, however, no employment was given prisoners in 29 States.

CONVOCATION, an assembly of the clergy. Specifically the name given to either of two such gatherings, the one termed the Convocation of Canterbury, or simply Convocation, the other the Convocation of York. In theory the Church of England is governed by means of the convocations of its bishops and clergy. Each of the two ecclesias-

tical provinces of Canterbury and York has its Convocation consisting of two houses, the upper composed of Bishops presided over by the Archbishop, and the lower being made up of the deans of Cathedrals, archdeacons, and proctors elected from the Cathedral chapters, with two additional proctors elected by clergy at large in the province of Canterbury and by the archdeacons in the province of York. The life of the Convocation is coincident with that of Parliament.

CONVOLVULUS, a genus of plants, the typical one of the order *Convolvulaceæ* and the tribe *Convolvuleæ*. The flowers are small and of a pale rose color. It is common in fields and hedges, especially when the soil is light. *C. Soldanella*, the Sea-side Convolvulus or Bindweed, has reniform fleshy lines, and large rose-colored flowers. It has been sometimes placed in the genus *Calystegia*. *C. dissectus* abounds in prussic acid, and is one of the plants used in the preparation of the liquor called noyau.

CONVOY, a fleet of merchantmen under the protection of a ship or ships of war, or the ship or ships appointed to conduct and defend them from attack and capture by an enemy. In military language it is used for escort. Convoys were largely employed by the Allies in moving troop ships in the World War (1914-1918), as they supplied the best protection against submarine attacks. The transport of United States troops to Europe in 1917-1918 was under convoy, and not a ship was lost.

CONWAY, MONCURE DANIEL, an American author; born in Stafford county, Va., March 17, 1832. He was graduated at Dickinson College in 1849 and at the Harvard Divinity School in 1854, affiliating first with the Methodists and later with the Unitarians. From 1863 to 1884 he was minister at South Place Chapel, in London. He has written lives of Thomas Paine, Edmund Randolph, Hawthorne, and Thomas Carlisle, and also "Emerson at Home and Abroad," "Demonology and Devil Lore," etc. He died Nov. 16, 1907.

CONWAY, SIR WILLIAM MARTIN, an English explorer; born in Rochester in 1865. He was educated at Cambridge and was made Professor of Art at University College, Liverpool, soon after his graduation. In 1889 he explored Egypt; in 1892 the Himalayas; in 1894 the Alps; in 1898 the western slope of the Andes; and in 1900 the eastern slope of the Andes. He has published "Early Flemish Artists," "The Alps from End to End," "Climbing and Exploration in the Bolivian Andes," etc. He also wrote "Great Masters" (1904); "No Man's Land" (1906); "The Crowd, in Peace and War" (1915).

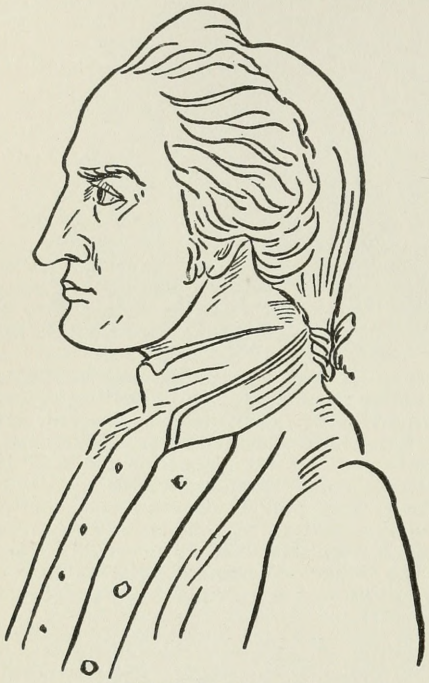
CONWELL, RUSSELL HERMAN, a Baptist clergyman and educator. He was born at Worthington, Mass., in 1843 and graduated from the Yale Law School in 1860. From 1862 to 1865 he served in the Union armies in the Civil War, after which he practiced law at Minneapolis. From 1869 to 1871 he was the foreign correspondent of the New York "Tribune" and the Boston "Traveler." Returning from abroad he practiced law in Boston until 1879. In that year he was ordained a Baptist minister and two years later was called to Grace Church, Philadelphia. Dr. Conwell founded and became president of Temple University, Philadelphia, and was the author of a number of books on religious and moral subjects.

COOCH-BEHAR, or **KUCH-BEHAR**, a native state in India, in political relation with the government of Bengal. It forms a level plain of triangular shape, intersected by numerous rivers, and is entirely surrounded by British territory. The greater portion of the soil is fertile and well-cultivated. Area, 1307 square miles; pop. 593,000. The chief town, Cooch-Behar, contains handsome public buildings and a splendid new palace of the Maharajah.

COOK, FRANCIS AUGUSTUS, an American naval officer, born in 1843. He graduated from the United States Naval Academy in 1863 and served during the Civil War. He rose through the various grades, becoming captain in 1896. During the Spanish-American War he commanded the cruiser "Brooklyn." At the Battle of Santiago Bay, the "Brooklyn," in his command, destroyed the Spanish vessel "Cristobal Colon." Until his retirement in 1903 he served on the Naval Examining and Retiring Board. He died in 1916.

COOK, JAMES, a British navigator; born in Yorkshire, in 1728, of parents not above the rank of peasantry. He was at first apprenticed to a shopkeeper, but became a sailor. In 1755 he entered the royal navy, and four years later as sailing-master of the "Mercury" surveyed the St. Lawrence river and the coast of Newfoundland. Some observations on a solar eclipse, communicated to the Royal Society, brought him into notice, and he was appointed commander of a scientific expedition to the Pacific. During this expedition he successively visited Tahiti, New Zealand, and discovered New South Wales. In 1772 Captain Cook, now raised to the rank of

a commander in the navy, commanded a second expedition to the Pacific and Southern oceans. In 1776 he again set out on an expedition to ascertain the possibility of a N. W. passage. On this voyage he explored the W. coast of



CAPTAIN JAMES COOK

North America, and discovered the Sandwich Islands, on one of which, Hawaii, he was killed by the natives, Feb. 14, 1779.

COOKE, GRACE MACGOWAN, an American writer, born in Grand Rapids, O., in 1863. She was educated privately. In 1877 she married William Cooke. She was the first president of the Tennessee Woman's Press Club. Her writings include "Mistress Joy" (1902); "Hulda" (1904); "The Power and the Glory" (1910); and "The Joy Bringer" (1912), and several books for children. She was a frequent contributor to magazines.

COOKE, JAY, an American financier; born in Sandusky, O., Aug. 10, 1821. He entered mercantile life at 15. Having learned banking he founded in 1858 the house of Jay Cooke & Co., which financed the Civil War Bond issues of the United States to the extent of $2,000,000,000. The house failed in 1873, causing widespread financial panic. In 1894 he re-established his fortune, investing in Western land and securities. He died Feb. 16, 1905.

COOKE, JOHN ESTEN, an American novelist; born in Winchester, Va., Nov. 3, 1830. He was an extensive contributor of stories, sketches, and verses to various periodicals, and has written many books, in which are included: "The Virginia Comedians" (1854), "Hilt to Hilt" (1869), "Life of Gen. Robert E. Lee" (1871), "Virginia, a History of the People" (1883), "The Youth of Jefferson," "Surry of Eagle's Nest," "Wearing the Grey," "Pretty Mrs. Gaston," "Virginia Bohemians," etc. He died near Boyce, Va., Sept. 27, 1886.

COOKE, MRS. ROSE (TERRY), an American poet and story writer; born in West Hartford, Conn., Feb. 17, 1827. Her complete poems were published in 1888: "The Gentian" and "The Two Villages" are good representatives. Her best short stories treat of New England rural life. The novel "Steadfast" appeared in 1889. Her finest work appeared originally in the "Atlantic Monthly" and other periodicals. She died in Pittsfield, Mass., July 18, 1892.

COOKERY, the art and practice of preparing food mainly by means of heat. The various processes of roasting, toasting, broiling, boiling, stewing, brewing, baking, grilling, braising, and frying, chemically or mechanically alter the constituent elements of organic matter and make them more easily digestible. Thus vigorous boiling serves to loosen the fibers of cellulose which constitutes the largest constituent of vegetable food.

The art of cookery was carried to considerable perfection among the Egptians, Persians, and Athenians. Extravagance and luxury at table were notable features of Roman life under the empire. Among moderns the Italians were the first to reach a high degree of art in this department. Their cooking, like that of the ancient Romans, is distinguished by a free use of oil. Italian cookery seems to have been transplanted by the princesses of the House of Medici to France, and was carried there to perhaps the highest degree of perfection; even yet the skill and resource which the French cook shows in dealing often with very slight materials is a highly creditable feature in the domestic economy of the nation. British cookery has been mostly confined to simple, strong, and substantial dishes. Attempts have been made in many places to diffuse a knowledge of cookery more widely among the lower classes. Cooking classes have been organized in the public schools and regular cooking schools have met with

great success. The philosophy of cookery has a very limited literature. In the third, sixth, and tenth essays of Benjamin Thompson, Count Rumford (1796), "The Chemistry of Cookery," by W. Mattieu Williams (1885); and the Cantor Lectures on "The Scientific Basis of Cookery," by the same author, the subject is treated as a branch of applied science.

COOK INLET, a bay of the Pacific Ocean, on the south coast of Alaska, about 200 miles in length and 60 miles at its greatest breadth. It is partially blocked with ice during the winter months, and in summer the rough coast line is subject to frequent storms, but navigation is being rendered less dangerous every year. It contains several islands, the largest being Augustine Island, which has a volcanic mountain. The Sushitna and other rivers flow into it, and several active volcanoes are on the coast, among them Mt. Iliamna, 12,066 feet high. The chief harbor is Seldonia, and there are a number of other growing towns overlooking the bay.

COOK ISLANDS, otherwise known as the Hervey Archipelago, lie about midway between the Society and Navigator groups, near 20° S. lat., and 158° W. lon., and are some volcanic, some coralline. The principal members of the cluster are Mangaia, Atiou, and Raratonga. The natives number about 7,000, mainly of the brown Polynesian stock. Formerly cannibals, they are now all Christians, and dress after the European fashion. The islands were annexed by Great Britain in 1888.

COOK, MOUNT, the highest peak of Australasia; is one of the southern Alps near the center of the range, on the W. side of the South Island of New Zealand. It is 12,349 feet high, is covered with perpetual snow (the snow-line being 3,500 feet lower than in Switzerland), is difficult of access, and was scaled for the first time by the Rev. W. S. Green on March 2, 1882.

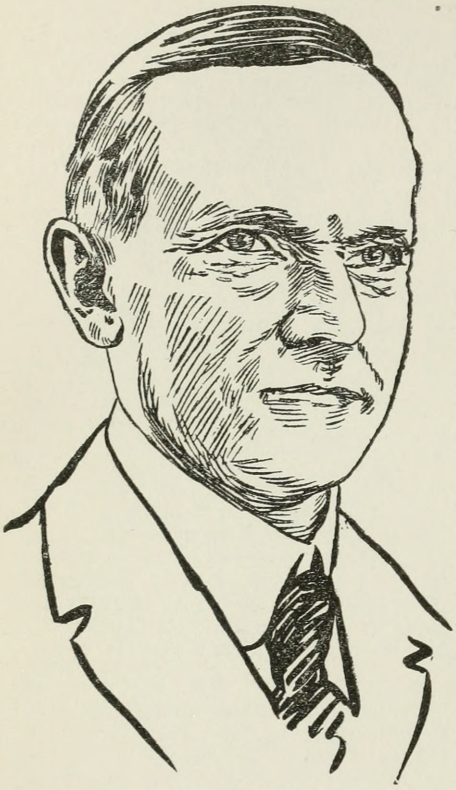
COOK STRAIT, discovered by Captain Cook on his first voyage, separates the N. and S. islands of the New Zealand group, and varies from 20 to 80 miles in width.

COOLEY, THOMAS MCINTYRE, an American jurist; born in Attica, N. Y., Jan. 6, 1824. He was Professor of Law in the University of Michigan (1859 and 1881); chief-justice of that State (1868-1869); chairman of the United States Interstate Commerce Commission (1887-1891). He wrote: "A Treatise Upon Wrongs and Their Remedies" (Vol. i., 1878); "General Principles of Constitutional Law in the United States" (1880); etc. He died in Ann Arbor, Mich., Sept. 12, 1898.

COOLIDGE, ARCHIBALD CARY, an American educator, born in Boston in 1866. He graduated from Harvard University in 1887 and studied in Berlin and in Paris. He acted as private secretary to his uncle, T. J. Coolidge, for several years, and in 1893 was secretary of the American Legation at Vienna. He was appointed instructor of history in Harvard University in 1893, becoming assistant professor in 1899 and professor in 1908. From 1911 he was director of the University Library. He was Harvard lecturer at the Sorbonne and other French universities in 1906 and 1907, and acted as delegate to the Pan-American Scientific Congress at Santiago, Chile, in 1908-1909. In 1913-1914 he was Harvard exchange professor at the University of Berlin. During the World War he acted as special agent of the State Department in Sweden and northern Russia, and was chief of the mission in Vienna. In 1919 he was attached to the Peace Conference as adviser and was a member of several scientific societies. He wrote "The United States as a World Power" (1908); and "Origins of the Triple Alliance" (1917).

COOLIDGE, CALVIN, an American public official, Republican candidate for vice-president in 1920. He was born in 1872 in Plymouth, Vt., and graduated from Amherst College in 1895. In the fall of that year he began the study of law in the offices of Hammond and Field in Northampton, Mass., and two years later was admitted to the bar. Soon after he entered the practice of law he was elected a member of the Northampton City Council, and has held public office almost continuously since. In 1900 and 1901 he was City Solicitor of Northampton. From 1907-1908 he was a member of the Massachusetts House of Representatives and later Mayor of Northampton. In 1912-1916 he served in the State Senate, being president of that body for two years. From 1916 to 1918 he held the post of Lieutenant-Governor of Massachusetts, and in 1918 was elected Governor of the State. During 1919 a strike of the Boston police left that city for a few days at the mercy of the lawless elements. Governor Coolidge took vigorous measures to enlist a volunteer force and refused to make any terms with the strikers who were discharged and not re-employed. His action brought him nation-wide fame and was indorsed by a majority of the citizens of

his State, who re-elected him Governor in 1919. He was nominated for vice-president on the first ballot by the Republican National Convention meeting in Chicago in June, 1920, and was elected on Nov. 4, 1920.

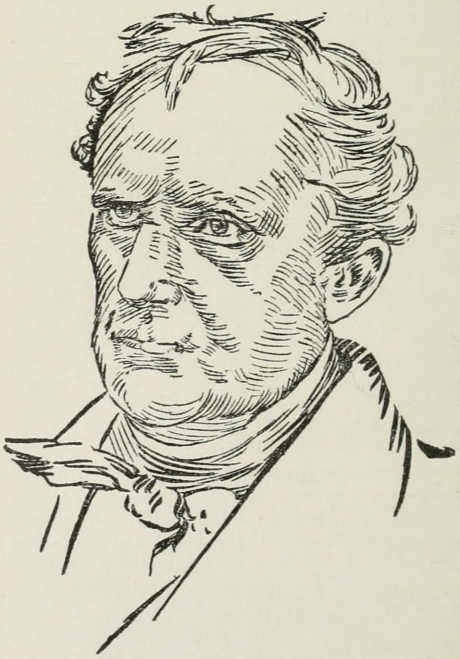


CALVIN COOLIDGE

COOLIDGE, T(HOMAS), JEFFERSON, an American diplomat, born in Boston in 1831. He graduated from Harvard University in 1850 and began business in the firm of Gardiner & Coolidge, East India merchants. He also took an active part in the development of railways in the West. He was president of the Atchison, Topeka, and Santa Fe, and other railroads. In 1892-1893 he was United States Minister to France, and in 1898-1899 he was a member of the Joint High Commission to adjust disputes between England and the United States. He gave the Jefferson Physical Research Laboratory to Harvard University.

COOLIE, a name in Hindustan for a day laborer, also extended to those of some other E. countries. Many of these have been introduced into the West Indies, Mauritius, and other places, their passage being paid for them on their agreeing to serve for a term of years. The first coolie emigrants appear to have been those sent to British Guiana from Calcutta in 1839 to supply the want of labor felt after the abolition of slavery. The coolies employed in Guiana are still chiefly from India. Coolies have also been introduced into Jamaica, Trinidad, Natal, and large numbers into Mauritius. There are over 600,000 in the British colonies. The Chinese coolies have been principally sent to Cuba and Peru. The name is also given to Chinese immigrants to the United States.

COOPER, JAMES FENIMORE, an American novelist; born in Burlington, N. J., Sept. 15, 1789; studied at Yale College, and entered the American navy as a midshipman at the age of 16. In 1821 appeared the novel of "Precaution," but it was not till the production of the "Spy" and the "Pioneers" that he began to take a high place among contemporary novelists. The "Pilot," "Waterwitch," "Pathfinder," "Deerslayer," "Last of the Mohicans," and "Red Rover" are familiar names to the novel-reading public. After visiting Europe and serving as consul of the United States at Lyons for three years, he returned to Cooperstown, N. Y., where he died, Sept.



JAMES FENIMORE COOPER

14, 1851. Besides his novels he wrote a history of the United States navy, and some volumes descriptive of his travels.

COOPER, PETER, an American inventor, manufacturer, and philanthropist; born in New York, Feb. 12, 1791. A coachmaker by trade, he became a successful inventor and glue manufacturer, and acquired a large fortune. He built, after his own designs, the first locomotive engine constructed on this continent (1830); was one of the original promoters of the electric telegraph, actively interested in the construction of the New York State canals, etc. He was the candidate of the "Greenback" party for President in 1876. He is best known by the institution that was dearest to his own heart, the "Cooper Union" of New York, founded for the instruction of the industrial classes (1854-1859). He wrote: "Political and Financial Opinions, with an Autobiography" (1877); "Ideas for a Science of Good Government" (1883). He died in New York City, April 4, 1883.

CO-OPERATION, when signifying social organization, and in its widest application, is the voluntary association of a number of persons for the attainment of certain economic advantages, as in the combination of farmers for the sale of their produce in such large volume as to eliminate parasitic middlemen. Specifically, however, the word signifies co-operation of the consumers, for the purpose of production and distribution of commodities for use, with the element of private profit eliminated.

The modern co-operative movement had its beginning in the now famous Rochdale co-operative society, founded by twenty-eight flannel weavers, in 1844, for the purpose of operating a foodstuff store on this principle. In the constitution of their society they first ennunciated those fundamental principles which are to-day the basis of the modern movement; one man, one vote; membership open to all comers; invested capital to receive no other reward than the current rate of interest; and the profits of the enterprise to be retained as collective capital, or returned to the purchasing members, to each in proportion to the volume of his trade with the society's store.

Beginning as small distributive enterprises, Rochdale co-operation attracted very little attention for over a generation. It was not till the numerous local food supply societies federated (1861 in England) and formed what was called a wholesale society, that the economic power of the movement began to attract public attention and aroused the alarm of the merchant class. Through these central, or national, purchasing agencies, the local societies were enabled to pool their purchases and to trade in such a volume as to make their influence felt on the general market. This influence was further enhanced when the federations, with their organized market behind them, began to manufacture to supply the needs of their own constituents. This entry into the field of production marked their economic independence of private industry, especially when large tracts of land were acquired for the production of raw material needed in manufacture. As an instance, the English Co-operative Wholesale Society now owns and operates 30,000 acres of farm land in England, on which it raises fruit for its jam factories, vegetables for canning, dairy products for distribution among the store societies; and an equal acreage in Ceylon and India for the production of tea; vast areas of land in Africa for cocoanut and palm oil; and 10,000 acres of land in Canada for the production of wheat for its flour mills, the largest in England. All these vast enterprises, including factories which are the largest of their kind in the world, are owned collectively and controlled democratically by the members of the local societies, the directors and managers being the paid servants of the collectivity. Thus use, or service, is the stimulus, rather than private commercial profit.

It has been only within the past few years, since the beginning of the World War, that the Consumers' Co-operative Movement has been recognized as a significant social movement, presenting itself as a distinct and practical alternative to Socialism, Syndicalism, or any of the other purely theoretical collectivist movements. This development of its social significance was entirely due to its abnormal growth during the war period, a result of its efficiency as a source of food supply during the dislocation of private trade and production. With a general world-wide membership of about 8,000,000, in 1914, the membership in 1920 stood at 24,000,000, each unit representing a family, rather than one individual. It was in Russia that this growth attained most abnormal dimensions, the membership attaining 15,000,000 throughout the country in 1920. In other countries, however, the development has also been remarkable. In France membership rose from 800,000 to over 1,500,000; in Great Britain it rose from a little over 3,000,000 in 1914 to over 4,000,000 in 1920. In Switzerland, Denmark, and Finland a majority of the population already is involved.

In the United States, before the war, the development of consumers' co-operation had been least marked, though it had a history of effort stretching back through fifty years. In 1916 the Co-operative League of America, the educational federation of the movement in this country, had a record of only 600 co-operative societies in the United States. To-day, in 1920, its card index directory indicates 4,000 such societies, most of them in the Middle West. In Illinois these societies have already federated into a wholesale society, doing a monthly business of $300,000. Another wholesale society has also appeared in Boston, supplying local societies in New England, doing a slightly smaller volume of trade. A third federation is located in Superior, Wis., supplying a large number of Finnish societies in that region, while the Pacific Co-operative League operates a central purchasing agency in San Francisco.

Being of spontaneous growth, consumers' co-operation is not based on any social theory of organization, as is the case with the other collectivist movements. But the movement itself, by its own practical development, has now suggested certain laws of social evolution which indicate a system of social organization peculiar to itself.

Thus considered, it may be said that co-operation is distinctly a social movement, in contrast to a class movement; that it is representative of the people as consumers, rather than as workers. Thus, it holds that consumption is the motive behind all industry, and on this element in society only may a true industrial democracy rest. In method it is evolutionary, as contrasted to the revolutionary method of Marxian socialism or the industrial action of syndicalism, or militant industrial unionism. While co-operation does not hesitate to employ political action to protect itself against discrimination, as has been the case in Great Britain, it is essentially an economic, non-political movement, in that it has no tendency to establish its practices by legislation. Consult: Leonard Woolf, "Co-operation and the Future of Industry" (London, 1918); Emerson P. Harris, "Co-operation, the Hope of the Consumer" (New York, 1918); Albert Sonnichsen, "Consumers' Co-operation" (New York, 1919).

COOPER UNION, or **COOPER INSTITUTE**, an institute founded in New York City in 1857 by Peter Cooper. Its object is to provide free schools of art and science, and free reading rooms and library for the working classes. The course in science includes the engineering, chemistry, astronomy, and mechanical drawing; and that of art includes architectural, industrial, and ornamental drawing, clay modeling and painting. Instruction is also given in English literature and Belles Lettres, wood engraving, pottery, typewriting, stenography, and telegraphy. There are lecture courses, a museum, an art gallery, and a library with a reading room containing current numbers of nearly 500 magazines and newspapers. The Institute was built at a cost of $630,000 and was endowed by Mr. Cooper with $300,000. It has received additional gifts from time to time from Edward Cooper and Abram S. Hewitt, and in 1899 Andrew Carnegie gave it $300,000 for the founding of a mechanical day art school. The endowment of the Union in 1920 amounted to about $3,000,000. Over 4,000 persons were enrolled in the various departments.

COORG, or **KURG**, an ancient principality, now a province in southern Hindustan, lying between Mysore on the E. and N. E. and the districts of South Canara and Malabar on the W.; area, 1,583 square miles. The country has a healthful climate, and yields coffee, spices, timber, etc. The capital is Merkara. Pop. (1901) 180,607.

COOT, a wading bird belonging to the family *Rallidæ*, and the sub-family *Gallinulinæ* (water hens). The head and neck are deep black, the upper parts slaty black, those beneath bluish ash, the bill and frontal plate white, the former with a slightly roseate hue, iris crimson, feet ash-colored with greenish tinge below the knee, above it yellow or greenish red. It is found in Great Britain, Holland, France, Germany, Switzerland, and throughout Europe. It deposits from seven to ten eggs of a brownish white color, spotted with dark brown.

COPACABANA, a small peninsula in the S. part of Lake Titicaca, Peru, which was a sacred place of the Incas and where many ruins of their temples and other buildings can still be seen. Thousands of pilgrims yearly visit the chapel there, which contains an alleged miraculous painting of the Virgin.

COPAIBA, the balsam or oleo-resin obtained from incisions made in the trunk of *copaifera multijuga* and other species of copaifera. Copaiba is about the consistence of olive-oil, light in color and transparent, with a peculiar odor, and an acrid, aromatic taste; it is perfectly soluble in an equal volume of benzene; it does not become gelatinous when heated to 270° Fahr., and is not fluores-

cent. It contains a resin, copaivic acid, and an essential oil, copaiba oil. It dissolves one-fourth of its weight of magnesia carbonate when heated, and remains transparent; it is said that a small quantity of water contained in the balsam first combines with the magnesia, forming a hydrate which is soluble in the resin. Copaiba acts as a stimulant on the mucous membranes, especially on the genito-urinary organs.

COPAL, a resin produced by a plant, *Rhus copallinum*, which grows in Mexico. It is obtained in rounded, nearly transparent, masses; is brittle and colorless, or slightly yellow. It is slightly soluble in alcohol and essentials oils, and is made into varnish by mixing in a melted state with oils.

COPAN, an Indian village in the S. W. corner of the Central American State of Honduras; in a mountainous region; the site of a city still populous at the time of the conquest, and of which magnificent ruins still remain; first described by Stephens.

COPE, CHARLES WEST, an English painter; born in 1811; studied at the Royal Academy and in Italy; and first exhibited at the Academy in 1831. In 1843 he gained a prize of $1,500 for his picture "The First Trial by Jury"; in 1844, by his fresco the "Meeting of Jacob and Rachael," secured the commission for one of six frescoes for the House of Lords, producing accordingly "Edward the Black Prince receiving the Order of the Garter." Altogether he executed eight frescoes for the House of Lords. Some of his noted works are: "Last Days of Cardinal Wolsey," "Prince Henry before Justice Gascoigne," "Departure of the Pilgrim Fathers," "Burial of Charles I.," "Parting of Lord William and Lady Russell," "L'Allegro and Il Penseroso," "Milton's Dream," "Ann Page and Slender," "Lear and Cordelia." He became an A. R. A. in 1844 and R. A. in 1848, but retired in 1883. He died in Bournemonco, Aug. 21, 1890.

COPECK (a lance), a Russian copper coin, so called from the impression of St. George bearing a lance, the hundredth part of a silver ruble, or about the eightieth part of a paper ruble.

COPELAND, CHARLES TOWNSEND, an American author and educator, born in Calais, Me., in 1860. He graduated from Harvard University in 1882. From 1893 to 1910 he was lecturer on English literature at Harvard, assistant professor from 1910 to 1917, and associate professor from 1917. He was Harvard University lecturer in the Lowell Institute on the university extension courses in English literature. He was the author of "Life of Edwin Booth" (1901), and edited "Letters of Thomas Carlyle to His Youngest Sister"; "Tennyson's The Princess"; and the works of other English poets.

COPENHAGEN (Merchants' Haven), the capital of Denmark, and headquarters of the national commerce, literature, and art; situated on the shore of the island of Zealand, in the Sound, which is here about 12 miles broad; an outlying portion, Christianshavn, stands at the N. end of the island of Amager or Amak, which is separated from Zealand by a narrow arm of the sea. The channel forms a fine and capacious harbor, which is bridged over so as to connect Christianshavn and the main part of the city at two points. To counterbalance the expected injury to the city's commerce from the opening of the Baltic Canal, a great free port (free from customs dues) was constructed in 1890-1894 to the N. of the harbor. The business quarter stretches from the harbor in a N. E. direction toward the principal and central square, Kongens Nytorv, which in itself forms the focus of the life of the city. Farther N. E. of this point lies the aristocratic quarter, with the handsome Amalienborg Square and its royal and ministerial palaces.

Among its few buildings of historical interest or intrinsic beauty, the metropolitan cathedral church, known as Vor Frue Kirke, possesses a baptismal font, designed and in part executed by Thorwaldsen. Trinitatis Kirke is remarkable for its round tower, which is ascended by a winding causeway instead of steps; and Holmens' Kirke contains interesting monuments to the great naval heroes, Juel and Tordenskjöld. The royal palace, called Christiansborg, was rebuilt between 1794 and 1828. The principal part of the vast building was destroyed by fire in 1884. Happily most of the pictures in its great art gallery were saved. The castle of Rosenborg (1610-1624), where the regalia are kept, contains interesting art objects; and the palace of Charlottenborg (1624), is now used as an academy of arts. The university was founded by Christian I. in 1479. Connected with the university are a surgical academy, an observatory, a botanical garden, a zoological museum, a polytechnic institution, and a library of 250,000 volumes, containing also a great collection of ancient Persian MSS., and another of ancient Northern MSS. Copenhagen is the center, not only of Danish, but Northern literature and art, and is the seat of a number of societies, among

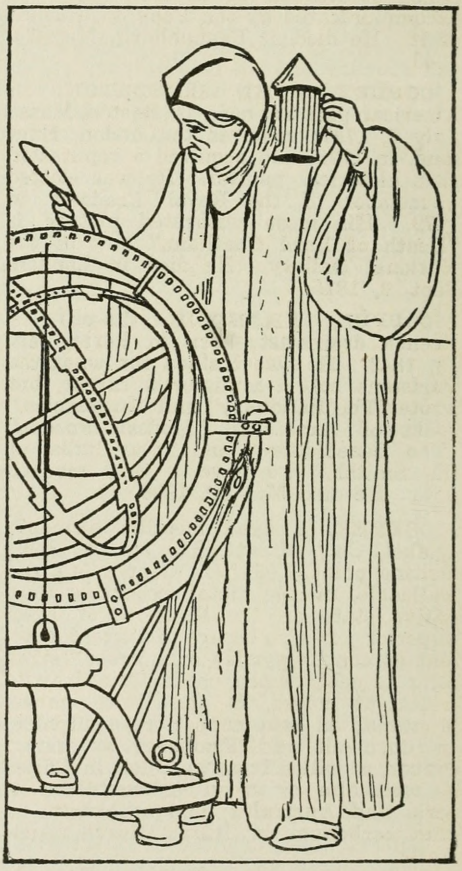
which are the Royal Society, founded in 1742; and the Royal Society of Northern Antiquaries, founded in 1825; as well as agricultural and others. The royal library contains 500,000 volumes. The Museum of Northern Antiquities in Prindsens Palais, is unrivaled in its kind. The Thorwaldsen Museum consists of works of art by that sculptor himself, and others left by him to the Danish nation. The chief exports of Copenhagen are grain, rape-seed, butter, cheese, beef, cattle, wool, hides, bones, and grain-spirit. Porcelain, pianos, clocks, watches, mathematical instruments, chemicals, sugar, beer, and tobacco are manufactured.

About the middle of the 12th century, Copenhagen was but a fishing village. In 1254 the village obtained the privileges of a town, and in 1443 King Christopher made it the capital of the kingdom. It was several times attacked by the Hanseatic League; was besieged by the Swedes in the 17th century; was bombarded by the English, Dutch, and Swedes in 1700; suffered grievously by fires in 1728, 1794, and 1795; witnessed a great sea-fight in its roads on April 2, 1801, when the English, under Sir Hyde Parker, with Nelson as his second in command, destroyed the Danish fleet; and (to prevent the Danish fleet from falling into the power of Napoleon), was bombarded by the English from the 2d to the 5th of September, 1807, when great destruction was wrought, both in houses and public buildings, and hundreds of persons lost their lives. Pop. (1916) 506,390.

COPENHAGEN, UNIVERSITY OF, the oldest university in northern Europe and the only one in Denmark, founded in 1478 and modelled after the university of Cologne, to which most of the Danish students had gone prior to that date. The university suffered so much from the wars and commotions attending the Reformation that it had to be re-established in 1539, this time taking as its model the university of Wittenberg. Destroyed by fire in the 18th century, it was established in its present form in 1788. During the first half of the 19th century many men famous in Norse scholarship taught at Copenhagen. It is open to both sexes and its present enrollment (1919) is over 3,000. It is endowed, but a great share of its income is derived from the state. There are no charges for tuition. Attached to it are zoölogical and botanical gardens.

COPEPODA, an order of *Crustacea*, ranked under the subclass entomostraca and the legion lophyropoda. They are animals of small size, the body divided into two segments, viz., a cephalothorax and an abdomen. There are two pairs of antennæ, two pairs of footjaws, and five pairs of ordinary feet furnished with bristles and adapted for swimming. There are two families, the cyclopidæ, which have but a single eye; and the cetochilidæ, which have two eyes. The English book-name of the Copepoda is oar-footed crustaceans.

COPERNICUS, or KOPPERNIGK, NICHOLAS, a noted astronomer; born in Thorn, Poland, Feb. 19, 1473. Having studied medicine at Cracow, he afterward devoted himself to mathematics and astronomy, and in 1500 taught mathematics at Rome with great success. Returning to his own country he was made



NICHOLAS COPERNICUS

a canon in the cathedral of Frauenburg, and began to work out his new system of astronomy. Doubting that the motions of the heavenly bodies could be so complicated as the Ptolemaic system

made them, he was induced to consider the simpler hypotheosis that the sun was the center round which the earth and the other planets revolve. Besides this fundamental truth Copernicus anticipated many other of the principal facts of astronomical science, such as the motion of the earth round its axis, the immense distance of the stars which made their apparent position the same from any part of the earth's orbit, etc. His general theory also enabled him to explain for the first time many of the important phenomena of nature, such as the variations of the seasons and the precession of the equinoxes. The great work in which Copernicus explained his theory "On the Revolutions of the Celestial Orbs," was completed in 1530, and published at Nuremberg in 1543. He was excommunicated by the Pope on account of it. He died at Frauenburg, May 24, 1543.

COPLEY, JOHN SINGLETON, an American painter; born in Boston, Mass., July 3, 1737; removed to London, England, in 1776, and acquired a reputation as a historical painter. He was elected a member of the Royal Academy in 1779. His most celebrated picture is "Death of Lord Chatham," now in the National Gallery. He died in London, Sept. 9, 1815.

COPPÉE, FRANÇOIS (ko-pā), a French dramatist; born in Paris, Jan. 12, 1842. He was trained for what the Parisians call a ministerial career, but wrote "The Reliquary" and "Intimacies," books of verse. In "Modern Poems," "The Benediction," and "The Strike of the Smiths," we have a very modern note. He died May 23, 1908.

COPPER, a dyad metallic element; symbol, Cu.; at. wt. 63.5; sp. gr., 8.95; melting point, 1,091° C. Copper is a red malleable, ductile metal, occurring in a native state on the S. shore of Lake Superior. It also occurs to a greater extent as copper pyrites of a brass yellow color as peacock ore, characterized by its iridescent colors, in the Butte mines, Montana; as gray copper ore, a sulphide, in Cornwall and Freiberg; as indigo copper, so called from its color, in Chile; as malachite, or green carbonate, in Siberia and Australia; and as azurite or blue carbonate in Burra Burra, Australia.

Copper forms several alloys. Brass is an alloy of two-thirds copper and one-third zinc; bronze, gun-metal, and bell-metal are alloys of copper with tin. Copper forms two series of compounds, the cuprous and cupric salts. Copper arsenite, or Scheele's green, is used as a pigment for wall papers; it is very poisonous. Copper salts are detected by giving in an acid solution a black precipitate with H_2S. All salts of copper are poisonous. Verdigris is an acetate of copper, often formed by cooking food in copper vessels.

Production.—Since the census year 1880 the United States has risen to the rank of the largest copper producer in the world, outstripping by far any other country. The production of copper in the United States in 1919 was 1,310,541,529 pounds. The production in 1918 was 1,908,533,595 pounds. The largest production was from Arizona, which contributed 536,513,368 pounds. Michigan was second with 201,716,335 pounds, and Montana third with 176,189,873 pounds. The production of Utah was 148,057,450 pounds. Other States producing over 50,000,000 pounds were New Mexico and Nevada. Alaska produced 56,534,992 pounds. The total value of the production in 1919 was $243,761,000, compared with a value in 1918 of $471,408,000. The imports of copper ore in 1919 amounted to 49,716,511 pounds. There were imported 263,220,449 pounds of unrefined black copper, and copper in bars, pigs, or other forms. The exports of copper in 1919 amounted to 516,627,775 pounds.

History.—Copper has been known since prehistoric times. There may have been a copper age before that of bronze. The latter compound metal, an alloy of copper and tin, was known long before brass had been made. The word copper occurs once in the Old Testament (Ezra viii: 27), but what is in many places called brass should have been rendered copper. Copper was in use in ancient Assyria. The classical nations were familiar with it. The Greeks brought it from Cyprus, the mines being at Tamassus, near Famagosta. Copper mines were first opened in England A. D. 1189, but not very successfully till A. D. 1689.

COPPERAS, sulphate of iron or green vitriol ($FeSO_4.7H_2O$), a salt of a peculiar astringent taste and of a fine green color. When exposed to the air it assumes a brownish hue. It is much used in dyeing black and in making ink, and in medicine as a tonic. The copperas of commerce is usually made by the decomposition of iron pyrites.

COPPERHEAD, a venomous serpent, closely allied to the rattlesnake, found in the United States from New England to Florida. It has a thick body from 2 to 3 feet long. Lurking in dark and moist places, and giving no warning, it is more dreaded than the rattlesnake.

COPPERMINE RIVER, a river of Mackenzie district, Canada, 475 miles long, having its source in a small lake north of Lake Gras through which it flows to Coronation Gulf in the Arctic Ocean. The stream, flowing between hills and morasses, is too rapid to be navigable. Hearne discovered the river in 1771, and part of it was explored by Franklin in 1821.

COPPER NICKEL, or **KUPFER-NICKEL**, an ore of nickel, an alloy of nickel and arsenic, containing about 60 of the former and 40 of the latter, of a copper color, found in the mines of Westphalia.

COPPER PLATE, a polished plate of copper on which the lines of some drawing or design are engraved or etched to be printed from; also a print or impression from such a plate.

COPPER PYRITES, or yellow copper ore, a double sulphide of copper and iron composed in equal parts of copper, sulphur, and iron. It occurs mostly in primary and metamorphic rocks, and is the chief copper ore of England.

COPPER RIVER, also called Atna, a river of Alaska, having its source in the Copper Glacier on Mt. Wrangel and flowing in the Gulf of Alaska. The upper river flows first N. then W. through a wide plain, and the lower through defiles in the Chugach Mountains. It is about 300 miles long; its basin is about 23,000 square miles in area, and its fall is about 3,600. The name of the river was derived from the belief that it held copper in solution. It has several tributaries, the chief being the Chitna, which flows into it from the E.

COPPICE, or **COPSE WOOD**, a wood in which the trees are cut over periodically as they attain a certain size. The period for cutting varies with the soil and the tree. The oak usually requires from 15 to 25 years' growth, while the willow is cut regularly every year. The term is also used in a general sense for a wood of small growth, or consisting of underwood and brushwood.

COPRA, the dried kernel of the cocoanut, from which the oil has not yet been expressed.

COPT [said to have been derived from Kupt (Coptos), a city in Upper Egypt, now Ckooft or Gooft, to which the Christians sometimes fled during persecution by the Romans. The Rev. Dr. John Wilson considers that the Arab Gubt or Gibt is simply Gr. *Aigyptos*=Egypt], one belonging to the Coptic Church; one of the old Egyptian race.

COPTIC, pertaining to the people called Copts, or to their sect; the remnants of the once numerous Church of Egypt — that which had the celebrated school at Alexandria. It broke off from the body Catholic in embracing the Monophysite doctrine, viz., that not two natures, but only one, existed in Christ, a view from which it has never since departed. About 250,000 Copts still exist in Egypt, mostly in its upper province.

The Coptic language was the language not of the old Egyptians who built the pyramids and covered monuments and temples with hieroglyphics, but of their successors subsequent to the introduction of Christianity. It continued till the 10th century, when it was in large measure superseded by Arabic. By the 17th it had ceased to be spoken, and existed only as a written dialect. While it lived three dialects were recognized, the Sahidic, in Upper Egypt; the Bahiric or Memphitic, in Lower Egypt; and the Bashmuric, in the Delta.

COPYING MACHINES AND PROCESSES, the various methods of producing duplicates of written or typed copy without transcription may be divided into two general classes—those in which the copies are made at the same time as the original, and those in which the copies are made after the original is completed.

The most common of the first methods is the use of carbon paper between sheets of thin writing paper. This method can be used on a typewriter, and anywhere from one to ten satisfactory copies can be made with little additional effort.

Of the second type, a common method is to write the original with special heavy ink. The original is pressed against a gelatinous surface which absorbs some of the ink. Copies of the original may be made by pressing sheets of paper against the surface.

In another system a stencil is cut by a typewriter or with a special stylus in waxed or other specially prepared paper. This stencil is placed on a roller, and inked from the inside, and will produce an almost unlimited number of copies, when paper is passed over its surface. This is the mimeograph apparatus and was said to be invented by Thomas A. Edison in 1878. It has since been subject to many changes and improvements.

In recent years the photostat system of direct photograph has been used for securing copies of valuable papers, and the blue-print process is still the most

used method of reproducing engineers' drawings, architects' plans, etc.

COPYRIGHT, the exclusive right of property in any intellectual production; the protection afforded by the law for a limited number of years to the originator of any written or printed composition or work of art, or to his heirs and assigns, whereby persons unauthorized are prevented from multiplying and selling copies, or, in case of dramatic works, from representing them on the stage. Such rights were claimed by authors before the introduction of printing. After the invention of the printing press, the right to publish books became the subject of licenses and patents. The common law affords a certain measure of protection to works unpublished or published only for a limited purpose. The writer of a letter, for example, transfers his property in it to the receiver; but the receiver has no right to print it for sale or distribution without the writer's consent. The copyright in published works is the creation of statute; the first Copyright Act was passed in 1709; and by virtue of its provisions authors acquired the sole liberty of printing their books during a term of 14 years from first publication, and, if the author should be living at the end of that time, during a further term of 14 years.

At the Union with Ireland, the Copyright Act was extended to that country, and the trade in cheap editions, printed in Dublin and secretly imported into Great Britain, came to an end. In 1814 the term of copyright was extended to 28 years, and the residue of the author's life, if he were living at the end of the term. The basis of the existing law is the Copyright Act of 1842. In Great Britain the term of copyright in a book is 42 years, or the life of the author and seven years, whichever of the two terms is the longer. No copyright can be enjoyed in seditious or immoral publications, or in books first published out of the United Kingdom. Articles contributed to encyclopædias and periodicals and books published in parts or series belong to the proprietor; but he may not publish them separately without the writer's consent, and after 28 years the copyright reverts to the author. Dramas and musical pieces, if first published in book-form, are subject to the same rules as books; but if they are performed in public before appearing in print, the author retains the sole right of permitting them to be represented during the term of copyright; and this right is distinct from the copyright he acquires if his drama or piece is published as a book. By an Act of 1882 the proprietor of a piece of music, desiring to reserve the right of performance, must give notice to that effect on the cover. Verses may not be taken from a copyright work and set to music for sale, without permission. A novel may be dramatized without the author's permission; but if copies of the drama are published containing passages borrowed in substance from the novel, the author of the adaptation is liable to an action. The right to dramatize can only be exercised with precautions which must greatly restrict it in practice.

Copyright in engravings, maps, etc., is secured by several Acts; the term is 28 years. Each plate and print must bear the name of the proprietor. Copyright in paintings, drawings, and photographs is secured to the artist during his life and seven years after by an Act of 1862. In 1874 the Canadian Copyright Act enabled a British author to obtain copyright in Canada for 28 years, provided his work be published in the colony. This right is concurrent with and in addition to the rights given by the imperial Act of 1842. By the laws in force in 1904 the author has in Great Britain exclusive right to his publication for 42 years or for his life plus seven years, whichever may be the longer, but to obtain this right he must copyright the book, give one copy to the British Museum within a month, and certain other copies on demand.

Section 4,952 of the "Revised Statutes" of the United States, in force Dec. 1, 1873, as amended by the Act of June 18, 1874, as amended by the Act of March 3, 1891, provides that the author, inventor, designer, or proprietor of any book, map, chart, dramatic or musical composition, engraving, cut, print, or photograph, or negative thereof, or of a painting, drawing, chromo, statuary, and of models or designs intended to be perfected as works of the fine arts, and the executors, administrators or assigns of any such person, shall upon complying with the provisions of this chapter have the sole liberty of printing, reprinting, publishing, completing, copying, executing, finishing, and vending the same; and in the case of a dramatic composition, of publicly performing or representing it, or causing it to be performed or represented by others. And authors or their assigns shall have exclusive right to dramatize or translate any of their works for which copyright shall have been obtained under the laws of the United States.

A printed copy of the title of the book, map, chart, dramatic, or musical composition, engraving, cut, print, photograph

or chromo, or a description of the painting, drawing, statue, statuary, or model or design for a work of the fine arts, for which copyright is desired, must be delivered to the Librarian of Congress or deposited in the mail, within the United States prepaid, addressed "Librarian of Congress, Washington, D. C." This must be done on or before day of publication in this or any foreign country. Not later than the day of publication in this country or abroad, two complete copies of the best edition of each book or other article must be delivered or deposited in the mail within the United States, addressed "Librarian of Congress, Washington, D. C.," to perfect the copyright. The freight or postage must be prepaid or the publications inclosed in parcels covered by printed penalty labels, furnished by the Librarian, in which case they go free by mail (not express), without limit of weight, according to the rulings of the Postoffice Department. Books must be printed from type set in the United States, or plates made therefrom; photographs from negatives made in the United States; chromos and lithographs from drawings on stone or transfers therefrom made in the United States. Without the deposit of copies above required, the copyright is void and a penalty of $25 is incurred. The law requires one copy of each new edition wherein any substantial changes are made to be deposited with the Librarian of Congress.

No copyright is valid unless notice is given by inserting in every copy published on the title-page or the page following if it be a book; or if a map, chart, musical composition, print, cut, engraving, photograph, painting, drawing, chromo, statue, statuary, or model or design intended to be perfected as a work of the fine arts, by inscribing on some portion thereof, or on the substance on which the same is mounted, the following words, viz.: "Entered according to Act of Congress in the year ——, by ————————, in the office of the Librarian of Congress, at Washington," or at the option of the person entering the copyright the words: "Copyright, 19—, by ————————." The copyright law secures to authors and their assigns the exclusive right to translate or to dramatize any of their works; no notice is required to enforce this right. The original term of copyright runs for 28 years. Within six months before the end of that time, the author or designer, or his widow or children, may secure a renewal for the further term of 14 years, making 42 in all. In the case of books published in more than one volume, or of periodicals published in numbers, or of engravings, photographs, or other articles published with variations, a copyright must be entered for each volume or part of a book, or number of a periodical, or variety as to style, title, or inscription, of any other article. To complete the copyright on a book published serially in a periodical, two copies of each serial part, as well as of the complete work (if published separately), should be deposited.

To secure copyright for a painting, statue, or model, or design intended to be perfected as a work of the fine arts, a definite title and description must accompany the application for copyright, and a mounted photograph of the same, as large as "cabinet" size, mailed to the Librarian of Congress not later than the day of publication of the work or design. The fine arts, for copyright purposes, include only painting and sculpture, and articles of merely ornamental and decorative art should be sent to the Patent Office; as subjects for Design Patents. Copyrights are not granted on trade-marks or on names of companies, libraries or articles, or on an idea or device or on prints or labels intended to be used for any article of manufacture. If protection for such names or labels is desired, application must be made to the Patent Office.

Until 1891 copyright could be acquired only by a citizen of, or permanent resident in, the United States. By acts of 1909, 1912, 1913, 1914 protection was extended to photo-plays and pictures and many art productions. In December, 1887, the convention of Berne brought nearly all the states of Europe into copyright relations with one another. This was the most important step ever taken in the history of the world's literary dealings, for it secured an almost universal recognition of the rights of authors. The rights of citizens or subjects of a foreign nation to copyright in the United States extend by Presidential proclamations to Great Britain, France, Belgium, Switzerland, Germany, Italy, Spain, Denmark, and Portugal, and Americans can secure copyright in those countries. For this direct arrangements must be made abroad. For an American citizen to secure copyright in Great Britain the title should be entered at Stationers' Hall, London, the fee for which is 5 shillings sterling, and 5 shillings additional if a certified copy of entry is required. The work must be published in Great Britain or in her dominions simultaneously with its publication in the United States, and five copies of the publication are required, one for

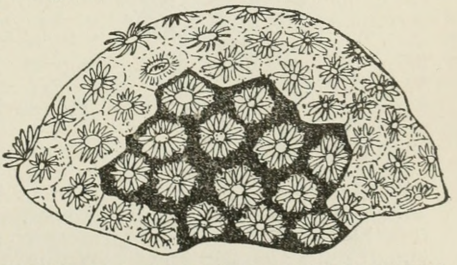
the British Museum and four on demand of the Company of Stationers for four other libraries. Copyright may be secured in France by a foreigner by depositing two copies of the publication at the Ministry of the Interior at Paris. No fee or entry title required. To secure copyright in Belgium a foreigner may register his work at the Department of Agriculture, Industry and Public Works, at Brussels. In Switzerland, register of title at the Department of Commerce and Industry at Berne is optional, not obligatory; fee, 2 francs. If registered, deposit of one copy is required. Copyright in Canada is to be registered with the Minister of Agriculture at Ottawa; fee, $1 for registry and 50 cents for certificate, and the work to be published in Canada and two copies deposited. In Greece the period during which an author can hold a copyright is restricted to 15 years. The Swiss grant copyright during the life of the author or his heirs during 30 years from the date of publication of his work. In Brazil the author enjoys a copyright for life, and it is extended for 10 years after his death. In Venezuela the copyright endures for the life of the author and 14 years after his death. In Holland and Belgium the copyright lasts during the life of the author and during 20 years after his death. In Germany, Austria, Hungary, and Portugal copyright endures during the life of the author and during 30 years after his death. The duration of copyright in Italy is regulated in a peculiar manner. It endures for the life of the author and 40 years after his death, or for 80 years after the publication of the work, the term of years being divided into two periods of 40 years each. If the author dies within the first period of 40 years the remainder of the term is enjoyed by his heirs or assigns. The second period of 40 years begins at the death of the author, if he has died after the first period of 40 years has elapsed; or if he has died before them, at the end of the first period of 40 years. During the second period any one is at liberty to republish the work on payment to the owner of the copyright of a royalty of 5 per cent. on the price which must be marked on the book. France, Norway, Sweden, and Denmark accord a copyright during the life of the author and 50 years after his death. The law of Spain accords a copyright during the life of the author and for 80 years thereafter.

COQUELIN, BENOÎT CONSTANT, a French actor; born in Boulogne, Jan. 23, 1841; was admitted to the Conservatoire in 1859; and having gained the second prize for comedy, made his début at the Comédie Français, Dec. 7, 1860, as Gros-René in the "Amorous Vexation." For over twenty-two years he played with unbroken success at the Théâtre Français, both in classical pieces and in rôles created by himself; in the broader aspects of comedy, standing without a rival. He left the Théâtre Français in 1886, and appeared in 1887 in London, in 1888 in South America and the United States. He wrote (with Coquelin the younger) "The Art of Monologue." He died Jan. 26, 1909.

COQUELIN, ERNEST ALEXANDRE HONORÉ, a French actor; brother of Benoît; born in Boulogne, May 16, 1848. He has played important parts on the stage of the Théâtre Français. He has written monologues, including "The Horse," "The Art of Monologue" (with the elder Coquelin), etc. He died Feb. 8, 1909.

COQUILLA NUT, the seed of the piassava or piacaba palm, one of the cocoanut group, a native of Brazil. The nuts are 3 or 4 inches long, oval, of a rich brown color and very hard, and are used in turnery for making umbrella handles, etc.

COQUIMBO, also called La Serena, capital of the Chilean province of the same name; near the mouth of the river Coquimbo, on three terraces. It is a handsome town, with a new cathedral, seminary, lyceum, and hospital. The port of Coquimbo is on a bay. It exports copper, silver, and manganese ores, wool, cattle, hay, and cobalt. The province of Coquimbo occupies the entire breadth of the country from the sea to the Andes. Its area is 13,457 square miles; pop., province, about 200,000; town, about 13,000. In the S. some farming is carried on. The main occupation is mining of copper, as also silver and gold.

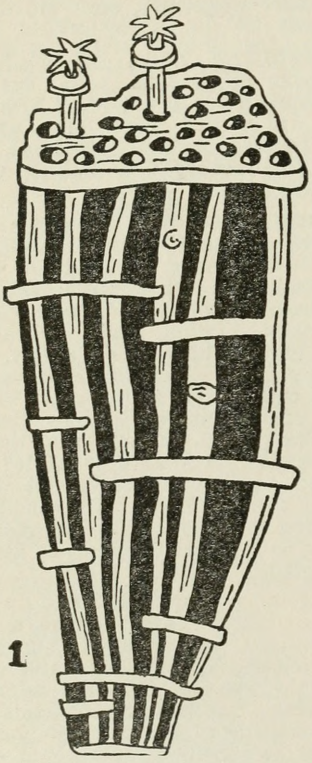


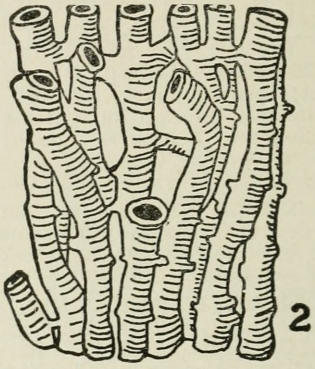
STAR CORAL—REEF CORAL TYPE IN LIVING CONDITION

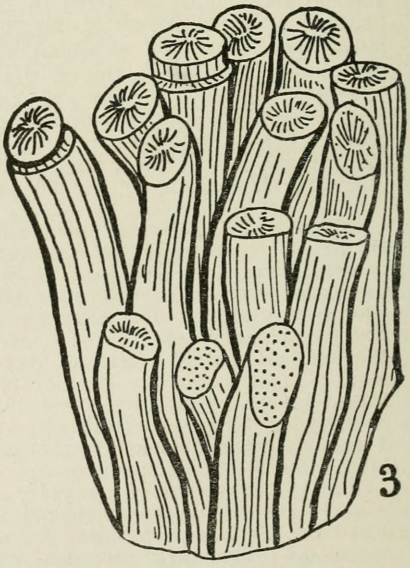
CORAL, the name applied to the calcareous stony structures secreted by

many of the actinozoa, which form one of the divisions of the cœlenterate zoöphytes, and also applied to the animals themselves. Two kinds of corals are distinguished by naturalists, *sclerodermic* and *sclerobasic*, or those in which the calcareous skeleton is developed in the walls of the body, as in the reef-building corals, and those in which (as in the red coral of commerce) the skeleton is external or cuticular. Reproduction takes place by ova, but chiefly by budding, the new individual remaining in organic union with the old. The coral masses grow not merely by the multiplication of individuals, but by the increase in height of each of the latter, which, as they grow, become divided transversely by partitions. The animal, distended with ova, collapses on their discharge, and thus becomes too small for the cup which it formerly occupied; it cuts off the waste space by a horizontal layer of coral, and the repetition of this process gradually adds to the height of the mass. It is in this way that the coral reefs and islands, occurring in such abundance in the Pacific, the Indian Ocean, and the Red Sea, are built up.

The coral of commerce is the production of various polyps, and is of different colors and internal structure. The red, pink, and black sorts are the most highly prized. The red coral has a branching shrublike form, and, as well as other sorts, is found abundantly in the Mediterranean. The coral fishery, as it is called, is carried on in various parts of the Mediterranean, the principal localities being the S. W. coast of Corsica, where the finest quality is found, the coast of south Italy, and the N. coast of Africa (Algeria and Tunis). The raw coral is wrought chiefly in Leghorn, Genoa, and Naples.







CORAL

1. Organ pipe Coral—skeleton of colony with two living polyps.
2. True or stony Coral.
3. Cup Coral.

CORAL FISHES, a name given to several fishes of different genera, belonging to the *Chætodontidæ*. They are found in all tropical seas, especially about coral reefs, and are all brilliantly colored. The most important is the *holocanthus imperātor*, the "emperor of Japan," which measures about 15 inches in length, and is the most esteemed of all the Indo-Pacific fishes.

CORBEL, a form of bracket used in Gothic architecture for the purpose of supporting the ends of timbers, arches, parapets, etc. It consists of a projecting block of stone, usually carved and having a receding face.

CORBEL, RICHARD, an English poet; born in Surrey, in 1582. A noted ecclesiastic of a jovial nature, he wrote a "Journey to France" and a "Farewell to the Fairies," and other verse. He died in Norwich, July 28, 1835.

CORBIE STEPS, in architecture, steps into which the sides of gables from the eaves to the apex are broken. They are common in old Scotch architecture.

CORBIN, HENRY CLARK, an American military officer; born in Clermont co., O., Sept. 15, 1842. He was educated in the common school, studied law, and entered the Union army in 1862 as lieutenant of volunteers rising for gallantry to brevet rank of Brigadier-General. Entering the regular army as lieutenant in 1866, he rose to be Adjutant-General in 1898 with rank of Brigadier-General; was appointed a Major-General of volunteers, and promoted to Major-General, U. S. A., in 1899. He died Sept. 8, 1909.

CORBIN, JOHN, an American writer, born in Chicago in 1870. He graduated from Harvard in 1892 and took post-graduate courses in Oxford. He was successively editor of "Harper's Magazine," dramatic critic of "Harper's Weekly," dramatic critic of the New York "Times" and New York "Sun," and literary manager of the New Theater, holding the latter position from 1908 to 1910. He wrote "Schoolboy Life in England (1898); "An American at Oxford" (1902); "The Cave Man" (1907); "The Edge" (1915). He was secretary of The Drama Society in New York from 1913 to 1916. From 1919 he was editorial writer of the New York "Times."

CORCHORUS, the genus of plants to which jute belongs, order *Tiliaceæ* (the lime-tree). They are herbs or small shrubs with serrated leaves and small yellow flowers.

CORCORAN, WILLIAM WILSON, an American banker; born in Georgetown, D. C., Dec. 27, 1798. He engaged in the banking business and accumulated a large fortune. His charities are estimated to exceed $5,000,000. He founded the Corcoran Art Gallery at Washington, where he died Feb. 24, 1888.

CORCYRA. See CORFU.

CORDAY, or CORDAY D'ARMANS, MARIE ANNE CHARLOTTE, a young Frenchwoman who killed the notorious revolutionist Marat. She was born in St. Saturnin, near Seez, in Normandy, in 1768, a granddaughter of the poet Corneille. Marat appeared to her the master-spirit of the atrocities perpetrated or threatened, and she determined to rid



CHARLOTTE CORDAY

the country of him. She left her home, and on arriving in Paris (July 12, 1793), she went to Marat's house, but was not admitted. On Saturday, the 13th, she purchased a large knife, and at 7 o'clock in the evening procured admittance to Marat. She had obtained this interview by writing to him that she was from the seat of rebellion, and would "put it in his power to do France a great service." Marat was in his bath. She, with desperate determination, plunged her knife into his bosom, and he instantly expired. She was condemned, and guillotined, July 17, 1793.

CORDELE, a city of Georgia, the county-seat of Crisp co. It is on the

Georgia Southern and Florida, the Seaboard Air Line, the Atlanta, Birmingham and Atlantic, and the Georgia, Southwestern and Gulf railroads. It is the center of an extensive cotton-growing region, and its manufactures include cottonseed, oil, and lumber. There are a library and other public buildings. Pop. (1910) 5,883; (1920) 6,538.

CORDIACEÆ, an order or sub-order of perigynous exogens, alliance *Solanales*. It is most closely akin to the *boraginaceæ*, and next to the *convolvulaceæ*. The species are found in the tropics of both hemispheres, in South America straggling into more temperate latitudes. Two hundred species of cordia itself are now known.

CORDIERITE, DICHROITE, or **IOLITE**, a natural silicate of magnesia, alumina, and ferric oxide. It crystallizes in stout orthorhombic prisms, and is of various shades of blue, sometimes with a tinge of gray or brown.

CORDILLERAS, a name applied in America to various chains of mountains. The Cordilleras of South America are described under ANDES; and the Rocky Mountains are the Cordilleras of North America. Those of Central America extend from Darien to the N. of Mexico, and gradually increase in elevation from the Isthmus of Panama, until they form magnificent plateaus, and reach a height of more than 17,000 feet in Mexico.

CORDITE, an explosive, the component parts of which are nitroglycerine, 58 per cent.; gun cotton, 37, and mineral jelly, 5. Acetone dissolves this combination, but evaporates in drying. One of the features that make cordite valuable is that its two ingredients, which by themselves are dangerous to handle, are almost harmless combined. It can hardly be exploded by accident. While in a plastic state it is pressed through a die in the form of a thread or cord and wound upon reels to dry.

CORDOBA, a central province of the Argentine Republic, mostly pampa land, rising to the Sierras de Cordoba and de Pocho in the W. Area, 62,160 square miles. Pop. about 770,000. Copper and silver are mined, but cattle-raising and agriculture are the chief industries. The climate is healthy, but very dry; the temperature ranges from 18° to 107° F. The capital, Cordoba, lies in the valley of the Rio Primero, 246 miles W. N. W. of Rosario. It is regularly built, with open watercourses running through the streets, has street railways, a cathedral with a fine Moorish exterior, numerous other churches, a handsome city hall, the old university building, with walls from 4 to 6 feet thick, a national observatory, and noble baths. The university (1613) sank greatly after the expulsion of the Jesuits (1767), until in 1870 several German professors settled here. The town possesses also a national college, a school of art, and an academy of sciences, which publishes a valuable "Boletin." Founded by Cabrera in 1573, the town was famous during the Spanish occupation as a seat of learning and the center of the Jesuit missions in South America. Pop. about 105,000.

CORDOBA, a town of Mexico, 66 miles W. S. W. of Vera Cruz; in a fruitful valley, 3,045 feet above the sea. Formerly important, it sank greatly after the revolution; but in later years it has recovered its trade. It is surrounded by rich coffee-plantations. Pop. about 9,000.

CORDOVA, an ancient Spanish city on the Guadalquivir, in Andalusia, capital of a province of the same name. A part of the town is of Roman, a part of Moorish origin. The cathedral is a splendid building, originally a mosque, erected in the 8th century by King Abderahman. The city is well supplied with schools, hospitals, and other institutions. It has always carried on considerable trade; and under the Moors the leather exclusively manufactured there (cordovan) was exported in all directions. Cordova, which was founded by the Romans, became the capital of Arabian Spain and the center of Arabian splendor and science under the caliphs of the West. With the decay of the Moorish empire it fell into the hands of Ferdinand III. of Castile. The province includes the fertile and beautiful valley of the Guadalquivir and the mountains of Sierra Morena. Pop. about 75,000.

COREA. See KOREA.

COREGONUS, a genus of abdominal fishes, family *Salmonidæ*. The teeth are very small or wanting, the scales very large, the height or front of the first dorsal greater than its breadth.

CORELLI, MARIE, an English author; born in Italy in 1864. In infancy she was adopted by Dr. Charles Mackay, the author. She was educated in London, and on beginning her literary career adopted as a pen name that which subsequently became her legal name. Her writings were greatly admired by Queen Victoria. She has published "A Romance of Two Worlds"; "Vendetta"; "Thelma"; "Ardath, the Story of a Dead Self"; "Wormwood"; "The Soul of Lilith"; "Barabbas"; "The Silence of the Mahara-

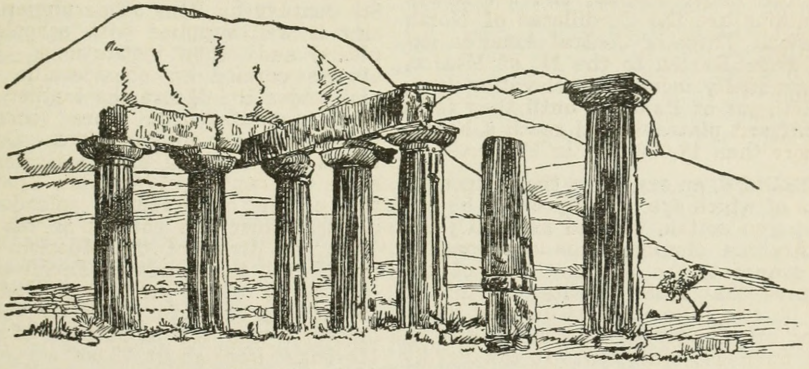
jah"; "The Sorrows of Satan" (the last two in 1895); "Cameos" and "Mighty Atom" (both in 1896); "The Master Christian" (1900); "God's Good Man" (1904); "Holy Orders" (1908); "Life Everlasting" (1911); "My Little Bit" (1919).

CORFU (anciently Corcy'ra), a Greek island in the Mediterranean, the most northerly of the Ionian Islands, at the mouth of the Adriatic, near the coast of Albania, about 40 miles long, and from 3 to 20 miles wide; square miles, 277. The surface rises at one point to the height of 3,000 feet, the scenery is beautiful, the climate pleasant and healthy, the soil fertile. Oranges, citrons, grapes, honey, wax, oil, and salt are abundant. A Corinthian colony settled in the island in the 8th century B. C. The Venetians possessed Corfu from 1386 to 1797, the British from 1815 to 1864. Pop. about 100,000. Corfu, the capital, is finely situated on a promontory which terminates in a huge insulated rock crowned by the citadel; the streets are Italian in style; chief edifices, the cathedral, government palace, and Ionian academy. There is a good harbor and considerable trade. Pop. about 27,000. The town is a winter resort for invalids. It was occupied by the Allies in the World War after 1915.

CORIANDER, an umbelliferous plant, *Coriandrum sativum*. It has an erect, leafy stem, the lower leaves bipinnate, the upper more divided, the uppermost of all nearly setaceous. Fruit globose, nearly undivided, with 10 obscure lines or ribs. It has escaped from cultivation and become wild in many places. It is a native of southern Europe and the Levant. The word occurs in Exod. xvi: 31, and Num. xi: 7. It is the rendering of the Hebrew word *gad*, and the translation is probably correct, for Celsus says that *goid* is coriander.

CORIGLIANO (kō-rēl-yē-a'nō), a town of southern Italy, in the province of Cosenza, on a hill above the right bank of the Corigliano, near the site of the ancient Sybaris, of which no vestiges remain. Pop. about 17,000.

CORINTH, a famous city of Greece within the Morea (ancient *Peloponnesus*), near the isthmus of the same name, between the gulfs of Lepanto (*Corinthiacus Sinus*) on the W., and of Ægina (*Saronicus Sinus*) on the E., 48 miles W. of Athens. Corinth was destroyed by an earthquake in 1858, and has now but few remains of its ancient splendor. The only interesting monument of antiquity is the citadel or Acrocorinthus. Corinth was first founded by Sisyphus, son of Æolus, A. M. 2616, and received its name from Corinthus, the son of Pelops. It was totally destroyed by L. Mummius, the Roman consul, and burnt to the ground, 146 B. C. The government of Corinth was monarchial till 779 B. C., when officers, called Prytanes, were instituted. Its inhabitants formed numerous colonies, and Paul preached the Gospel in it for upward of a year. After the taking of Constantinople it fell into the hands of the Turks, from whom it was retaken in 1687 by its former possessors, the Venetians. In 1715 it was again possessed by the Turks, who held it till 1823. Pop. about 5,000.



RUINS OF THE TEMPLE OF APOLLO AT CORINTH

CORINTH, a city and county-seat of Alcorn co., Miss., on the Southern, Illinois Central, and Mobile and Ohio railroads, 93 miles E. of Memphis, Tenn. It has machine shops, woolen mills, and other industries. During the Civil War Corinth was the scene of many battles. Brisk skirmishes were fought April 24 and 29, 1862, and on the 30th its railroad communications N. were cut by the Union forces. During May of the same year several encounters took place

here. Early on the morning of Oct. 4, the combined Confederate forces, under Van Dorn, Price, and Lovell attacked the Union lines at Corinth. The fight lasted until night closed the contest. The Union army was driven back into the town. The battle was renewed next morning, and raged fiercely till noon, when the Confederates were repulsed and retreated. The Confederates numbered in this fight 38,000 men; while General Rosecrans, who commanded the Union army, had not over 20,000. The Union loss was 315 killed, including General Hackleman, 1,812 wounded, and 232 missing; the Confederate loss was 1,423 killed; wounded estimated at 5,692; 2,248, including 137 officers, taken prisoners; and 3,300 stand of arms, 14 stand of colors, together with vast quantities of stores. Pop. (1920) 5,498.

CORINTH, GULF OF, a beautiful inlet of the Mediterranean, about 80 miles long, between the Peloponnesus and northern Greece, having the Isthmus of Corinth closing it in on the E.; also known as the Gulf of Lepanto.

CORINTH, ISTHMUS OF, the isthmus which connects the Morea (Peloponnesus) with northern Greece, varying in width from 4 to 8 miles. A canal, about 4 miles long, was constructed across the isthmus in 1882-1893, which enables vessels to sail from the Archipelago to the Adriatic without rounding Cape Matapan.

CORINTHIANS, EPISTLES TO THE, two epistles addressed to the Church at Corinth about A. D. 57 or 58, which have been admitted as genuine writings of St. Paul by even the most critical assailants of the New Testament canon.

CORK, a city in the S. of Ireland, capital of the county of Cork, situated on the river Lee. It is 15 miles from the sea, and besides an upper harbor at the city itself, and quays extending over 4 miles in length, there is a lower harbor at Queenstown, 11 miles below. Cork is the third city in Ireland, and exports great quantities of grain, butter, bacon, eggs, and live stock. The principal industries are tanning, distilling, brewing, and the making of tweeds and friezes. There are also iron foundries and yards for the building of iron ships. The principal buildings are the Protestant and Roman Catholic cathedrals, exchange, custom house, chamber of commerce, court house, Queen's College, etc. There is a naval dockyard at Haulbowline, an island within Cork harbor. The city was the scene of disorders during the Sinn Fein uprising of 1920. The Lord Mayor, Terence McSwiney, was found guilty of treason, and, refusing to eat while in prison, died of starvation. Pop. about 100,000.

CORK, the outer layer of bark of the cork oak. It is a very elastic tissue consisting of thin-walled nearly cubical cells. It does not peel off, but often contains long clefts. It forms a protection to the subjacent cells from injurious influences.

CORK, FOSSIL, a kind of mineral, a species of asbestos.

CORK, EARL OF. Real name, R. Doyle, an English artist.

CORKING PIN, a pin of a large size, formerly used for fixing a lady's headdress.

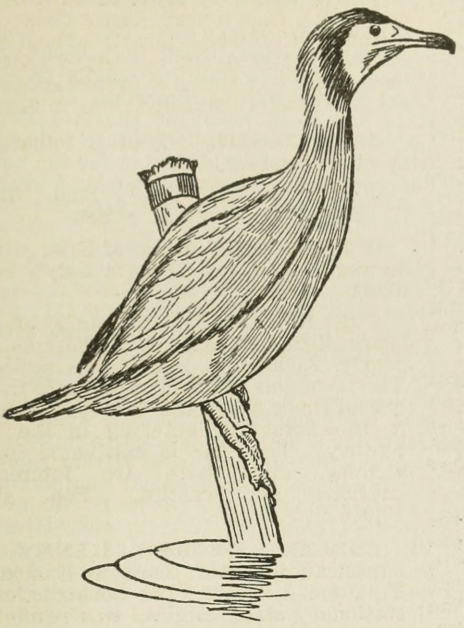
CORLEONE, town, province of Palermo, Sicily, 42 miles S. of Palermo, and nearly 2,000 feet above the sea-level. The town was of chief importance in mediæval times, when the Saracens occupied it, the Lombards entering in the 12th century. The vine is cultivated in the vicinity, and there are interesting churches and castles. Pop. about 15,000.

CORLISS, GEORGE HENRY, an American inventor; born in Easton, N. Y., June 2, 1817. The construction of stationary steam-engines was revolutionized by his improvements and a single engine made by him moved all the machinery in the Centennial Exposition of 1876. He died in Providence, R. I., Feb. 21, 1888.

CORMORANT (bald-headed raven), a genus of web-footed birds in the order *Steganopodes*, besides pelicans, solan-geese, and frigate-birds. They are familiar birds, frequenting islands in most parts of the world. The head is relatively small, and is naked behind the eyes and at the root of the beak. At the breeding season some forms exhibit a crest and wattles. There is a dilatable membrane beneath the lower jaw. The bill is moderately long, straight, rounded above, and strongly hooked at the end. The neck is long, snake-like and naked on the throat. The wings are of moderate length; the tail is rather short and rounded, but with stiff feathers, which are used as aids in progression.

The common British cormorant is an almost cosmopolitan bird about three feet long, for the most part of a blackish-green metallic color, with brownish feathers on the shoulder region. When in full breeding plumage it has a crest on the head, white plumes on the throat, and a white patch on the lower flanks. The bill is black, the face yellow, the feet also black. It was formerly trained

in England, as still in China, for fishing purposes. The dwarf cormorant from southeastern Europe, north Africa,



CORMORANT

southern Asia, and the Florida shag are other well-known species.

CORN, a hardened portion of the cuticle of the foot, appearing as a sort of distinct growth, produced by pressure. Corns are generally found on the outside of the toes, but sometimes between them, on the sides of the foot, or even on the ball.

CORN, the generic term for all kinds of grain used for making bread, and is applied specifically to the principal bread-stuff; in England to wheat, in the United States generally to maize, and frequently in Scotland to oats.

CORNACEÆ, Cornels, an order of epigynous exogens, alliance *Umbellales*. They are mostly trees or shrubs with opposite exstipulate leaves, capitate, umbellate, or corymbose flowers, with four sepals, four stamens, a filiform style, a simple stigma, a two-celled drupe, with a solitary pendulous seed in each. They are found in Europe, Asia, and the United States.

CORNBURY, EDWARD HYDE, lord, English governor of New York, was the son of the Earl of Clarendon, and one of the first officers who deserted the army of King James. King William, in gratitude for his services, appointed him governor of New York. He began his administration as a successor of Lord Bellamont, 1702. He was a bigot in religion, and oppressive and unjust in his administration of the government. He died in London, April 1, 1723.

CORN-COCKLE, the common name of *Agrostemma* (*Lychnis*) *Githago*. When its seeds become mixed with those of the grain among which they grow, and are ground with them, the effect is to render the grain unwholesome.

CORN CRAKE, or **LANDRAIL**, a species of bird of the order *Grallæ* or waders, and of the family *Rallidæ* or rails. The crakes differ from the rails proper in having the bill shorter. The common crake of Great Britain is of a reddish-brown color. It lives in fields and meadows, and feeds on worms and insects. It is a bird of passage, frequenting the northern parts of Europe during summer, and the southern, including the Mediterranean coasts of Africa, in winter.

CORNEA, one of the coats of the eye, a transparent membrane in the forepart of it.

CORNEILLE, PIERRE, the father of French tragedy and classic comedy, born in Rouen in 1606, at which place his father was advocate-general. He began his dramatic career with comedy, and a series of vigorous dramas. "Mélite" (1629), "Clitandre," "La Veuve," "La Suivante," etc., announced the advent of a dramatist of a high order. In 1635 he entered the field of tragedy with "Medea"; but it was not till the appearance of his next work, the famous "Cid," that Corneille's claim was recognized to a place among the great tragic poets. After the "Cid" appeared in rapid succession "Horace" (1639); "Cinna" (1639), his masterpiece, according to Voltaire; and "Polyeucte" (1640); works which show Corneille's genius at its best. Besides his dramas he wrote some elegies, sonnets, epistles, etc., as well as three prose essays on dramatic poetry. He died in 1684.

CORNEL, a tree (*Cornus sanguinea*) called the corn-tree, the female cornel, prickwood, dogberry-tree, dogwood-tree, hounds-tree, gaten, and gaten-tree. Its seeds furnish lamp-oil.

CORNELIA, an illustrious Roman lady; a daughter of Scipio Africanus, wife of Tiberius Sempronius Gracchus, and mother of the two famous tribunes. When a friend condoled with her on the death of her sons, she replied, "The woman who had the Gracchi for sons cannot be considered unfortunate." Her

literary talents must have been considerable, as Cicero very highly commends some of her epistles. She lived in the second century B. C., and after her death the Romans erected a statue to her memory, bearing the inscription, "To Cornelia, the mother of the Gracchi."

CORNELIAN, a cornel cherry (*Cornus mas* or *mascula*). It has little clusters of yellow, starry flowers studding its naked branches in early spring. It was formerly cultivated for the sake of its fruit, which is like a small plum. The Turks use it as an ingredient in sherbet. The fruit and leaves were formerly employed as astringents. It is sometimes called also the male cornel.

CORNELIUS, PETER VON, a German painter; born in Düsseldorf, Sept. 23, 1783. He early exhibited a taste for art, and studied the great masters, especially Raphael. In 1811 he went to Rome, where, in conjunction with Overbeck, Veit, and other associates, he may be said to have founded a new school of German art, and revived fresco-painting in imitation of Michael Angelo and Raphael. He left Rome in 1819 for Düsseldorf, where he had been appointed director of the academy, but he soon settled in Munich to give his whole attention to the painting of the Glyptothek and the Ludwigskirche there. In these two great works he was assisted by his Munich pupils. In 1833 he made another visit to Rome, and in 1839 he visited Paris. In 1841 he was invited to Berlin by Frederick William IV., who intrusted him with the painting of the royal mausoleum or Campo Santo. The most celebrated cartoon in this series is the Four Riders of the Apocalypse. The series consists of twelve paintings, which have been engraved. He died in Berlin, March 6, 1867.

CORNELIUS NEPOS, a Roman author of the first century B. C., the contemporary of Cicero and Catullus. The only extant work attributed to him is a collection of short biographies, probably an abridgment of a work written by Nepos.

CORNELL, EZRA, an American philanthropist; born in Westchester Landing, N. Y., Jan. 11, 1807. He accumulated a large fortune and is best known as the founder of Cornell University. He began life as a mechanic and miller at Ithaca, N. Y., and subsequently became a contractor for the erection of telegraph lines. He was a member of the State Assembly in 1862-1863 and of the State Senate in 1864-1867. He died in Ithaca, N. Y., Dec. 9, 1874.

CORNELL COLLEGE, a coeducational institution in Mt. Vernon, Ia.; organized in 1857, under the auspices of the Methodist Episcopal Church; reported at the end of 1919: Professors and instructors, 42; students, 600; number of graduates, 1,990; president, Charles W. Flint, LL. D.

CORNELL UNIVERSITY, a nonsectarian, coeducational institution, at Ithaca, N. Y., owing its origin to the Land Grant Act of Congress of 1862. It is named in honor of the late Ezra Cornell, who promised the State $500,000 with which to erect buildings for the new university, the terms of the land grant forbidding the use of its proceeds for that particular purpose, on condition that it should be located at Ithaca. His gifts amounted in all, however, to about $750,000. The University received besides Mr. Cornell's endowment, 990,000 acres of public domain, and large gifts from Henry W. Sage for a women's dormitory, a chapel, a library, a school of philosophy, a museum of archæology, etc., all generously endowed, John McGraw for a building devoted to museums and scientific laboratories, Hiram Sibley for a college of mechanical engineering and mechanic arts, Andrew D. White a priceless historical library, etc., Hiram W. Sibley for extending and enlarging the Sibley College of Mechanical Engineering, Dean Sage a fund for supplying the college pulpit, etc., A. S. Barnes a Christian Association building, William H. Sage for the chapel organ, the purchase of the great Zarncke library, a stone bridge, and in conjunction with Dean Sage, an endowed infirmary for sick students, Oliver H. Payne for the Cornell Medical College, and others. The total invested funds in 1920 were $17,875,436 and the total income for the fiscal year ending June 30, 1920, was $4,031,923. On the occasion of the University's semi-centennial celebration in June, 1919, the trustees began a campaign for new endowment and up to Jan. 1, 1921, had obtained cash and pledges amounting to about $6,000,000. The library comprised 610,000 volumes. The instructing staff numbered about 700. The total attendance at the end of 1920 was 5,176. There were about 25,000 graduates. The University annually grants free tuition to 600 students of New York State, also to students in Agriculture, and to New York State students in Forestry and Veterinary Medicine. There are numerous university undergraduate and graduate scholarships. The president in 1920 was Jacob Gould Schurman, who, after having served since 1892, resigned in June, 1920.

CORNET-À-PISTON, a metallic wind-instrument of the trumpet class, furnished with valves and stoppers. It was formerly called a cornopean. Its quality

is midway between that of the bugle and the trumpet. It is frequently used in orchestras where a trumpet is not obtainable, and also in church service in conjunction with the organ.

CORNETO, a picturesque, mediæval-looking town of central Italy, 12 miles N. of Civita Vecchia, 3 miles from the Mediterranean. Corneto rose out of the ruins of the Etruscan city of Tarquinii, whose remains, within a mile and a half of Corneto, are among the most important for the student of Etruscan history. The painted tombs, of which some 20 are specially interesting, were known in the 18th century; but it is mainly since 1842 that they have been examined; valuable new discoveries were made during excavations in 1881-1882.

CORN FLOUR, a name applied to the finely ground flour of maize or Indian corn; also known in the United States as corn meal.

CORN FLOWER, a well-known composite weed of cornfields, universally known and admired for the beauty of its wreath-like circle of outer barren florets, and the splendid deep azure of their hue. It was formerly of some little medicinal repute, and its blue flowers were used in domestic dyeing; from early times, too, it has been used for decoration in wreaths and garlands. This use became specially prominent in Germany after 1870, on account of its being the Emperor William's favorite flower.

CORNIFEROUS PERIOD, in geology, the second of the five divisions of the Devonian age, sometimes included with the first under the name of Lower Devonian. It contains the earliest discovered remains of fishes.

CORNIMIT, a by-product, obtained in the treatment of fish offal by a secret process originating in Denmark. It is claimed that by this process a high-grade oil and a fertilizer are also produced. Cornimit can be used as an electrical insulating material, and in the manufacture of such articles as combs, door-handles, telephone receivers, etc. The material is considered to be a satisfactory substitute for galalith, which is an artificial product make from milk casein.

CORN, INDIAN, also known as MAIZE, a genus of grasses having monœcious flowers; the male flowers forming a loose panicle at the top of the culm; the female flowers in axillary spikes, inclosed in large, tough spathes, from which only the extremely long styles hang out like tufts of feathers or silken tassels. The Common Indian Corn is generally believed to be a native of the warmer parts of America, where it was cultivated by the aborigines before the discovery by Columbus; but the discovery of grain in ancient houses in Athens have led some to suppose that it is a native also of the East, and from a very early period has been cultivated there, and even that it is the "corn" of Scripture. On this supposition it is not easy to account for the subsequent neglect of it until after the discovery of America, since which its cultivation spread rapidly throughout the Old World. Columbus himself took it to Spain.

The principal corn-producing countries of the world are the Argentine Republic, Canada, Egypt, Italy, Rumania, Russia, the United States, and Uruguay. Prior to the World War Hungary, Russia, and Bulgaria were among the large producers of corn. The production of corn in the United States in the calendar year 1920 was 3,232,367,000 bushels, from 104,601,000 acres. The States having the largest production were Iowa, Illinois, Nebraska, and Missouri. For table showing the acreage, production, and value of this crop in the United States by States, see AGRICULTURE.

CORNING, a city and county-seat of Steuben co., N. Y.; on the Chemung river and several railroads; is widely known for its extensive foundries, glass factories, railroad car works, and the coal mines in its vicinity. Pop. (1910) 13,730; (1920) 15,820.

CORNISH DIAMOND, a variety of quartz found in Cornwall, and employed even in the 16th century for personal ornaments. This variety being now scarce, ordinary rock-crystal is often used instead.

CORNISH LANGUAGE, a Celtic dialect spoken in Cornwall, which died out in the 18th century, though isolated words or terms are still in use, and some fragments of literature are still extant. It is allied to the Welsh and Breton.

CORN LAWS, various enactments of the British Parliament. The exportation of corn from England, except in certain cases, was prohibited by 34 Edward III. c. 20, 1361. The law was modified, and, in 1436, exportation was permitted by 15 Henry VI. c. 2, provided the home-price did not exceed 6s. 3d. per quarter. The importation of corn, unless the price of wheat exceeded 6s. 3d. per quarter, was prohibited by Edward IV. c. 2, 1463. The importation of corn was heavily taxed by 22 Charles II. c. 8, 1670, and also by 1 William and Mary, c. 12, 1689. The rapid increase of population, however, led to successive altera-

tions in the regulations respecting importation. Mr. Robinson's Act, 55 George III. c. 26 (March 23, 1815), removed all restrictions on foreign corn imported in order to be warehoused, and permitted its importation for home consumption when at 80s. per quarter. This bill was very unpopular, and occasioned serious riots in London and Westminster, March 6-9. By 3 George IV. c. 60, 1822, the importation price was reduced to 70s. per quarter. Mr. Canning's Corn Bill, proposed March 1, 1827, passed the House of Commons, but was rejected by the Lords. Several modifications were embodied by 9 George IV. c. 60, 1828, which is known as the sliding-scale, because the duty varied, and by 5 Victoria c. 14, 1842. Sir Robert Peel's Corn Importation Bill, 9 and 10 Victoria c. 22, 1846, reduced the duty on all corn imported at from 53s. per quarter to 4s. till Feb. 1, 1849, when the duty was permanently reduced to 4s. per quarter on all grain imported.

CORN SALAD, or **LAMB'S LETTUCE**, a genus of *Valerianaceæ*, humble annual weeds, of which some are used as spring salads, especially in France and Germany. The commonest species is *V. olitoria*, which is naturalized in the United States, and often called fetticus or vetticost. There are several native American species.

CORN SAWFLY, a hymenopterous insect, family *Tenthredinidæ*. The eggs are deposited on the stalks of wheat and rye, to which they are very destructive.

CORNSTONE, an arenaceous or siliceous limestone, often mottled and not infrequently concretionary. It usually occurs in those systems which are largely composed of reddish sandstones.

CORNUCOPIA, the horn of plenty, a horn wreathed and filled to overflowing with flowers, fruit, corn, etc. It was the symbol of plenty, peace, and concord. It was fabled to have been a gift from Jupiter to his nurse, the goat Amalthæa. It was a frequent attribute of Ceres.

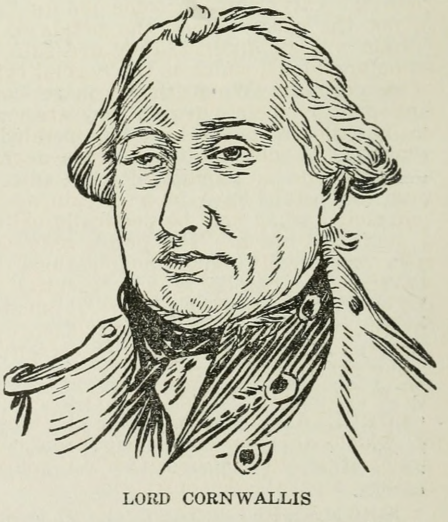
In botany, Cornucopiæ is a genus of grasses, tribe *Phalereæ*. The only known species is the *C. cucullata* (horn of plenty grass), often cultivated in gardens. It is a native of Greece and Asia Minor.

CORNUS, a genus of plants, the typical one of the order *Cornaceæ*. Calyx, four-toothed; petals, four superior; stamens, four. *C. sanguinea* has an arborescent stem, five to six feet high, with straight branches, the older ones dark red, and producing white flowers. It is found in woods and thickets, especially on a chalk or limestone soil. The dwarf cornel, *C. suecica*, is a herbaceous plant about six inches high, with few flowers, a creeping plant, growing in alpine pastures. The barks of *C. florida*, *C. sericea*, and *C. circinata* are used in the United States as substitutes for Peruvian bark in intermittent fevers. The Indians extract a scarlet color from the bark of the fibrous roots. *C. officinalis* is cultivated in Japan, where its fruits are an ingredient in the fever drinks of the country.

CORNWALL, a port of Ontario, Canada; at the mouth of the Cornwall canal, and on the St. Lawrence river, 67 miles S. W. of Montreal. Among numerous other factories it contains the principal woolen mill of the Dominion. The Cornwall canal gives the town exceptional water facilities. There are Episcopal, Presbyterian, Roman Catholic, and Methodist churches. Pop. about 7,000.

CORNWALL, BARRY. See PROCTER.

CORNWALLIS, CHARLES, MARQUIS, an English military commander; born in Brome, Suffolk, Dec. 31, 1738. He acted a conspicuous part in the American war. After gaining the battles of Camden and Guilford, he determined in invade Virginia, but, being surrounded by the American and French forces,



LORD CORNWALLIS

he and his army were made prisoners at Yorktown. In 1786 he was made Governor-General of India. The government of Bengal found it necessary to uphold the Rajah of Travancore against the Sultan of Mysore, and the first campaign being unsuccessful, in 1791 Cornwallis invaded the Mysore, besieged Se-

ringapatam, and compelled Tippoo Saib to submit on humiliating terms. Having performed this important service, Lord Cornwallis returned to England, was raised to the rank of marquis, and made Master-General of Ordnance. In 1798 he was sent to Ireland as Lord-Lieutenant; and in the trying and terrible scenes of the rebellion so conducted himself as to gain the good opinion of the public, while vigorously upholding and vindicating the laws. In 1801 he was sent on a mission to France, where, in 1802, he signed the peace of Amiens. In 1805, he was a second time appointed Governor-General of India; but soon after his arrival in India, he died in Ghazepore, Oct. 5, 1805.

CORŒBUS, a native of Elis, who was the conqueror at the Olympic games in 776 B. C., from which period the Olympiads are reckoned.

COROLLA, the inner whorl of two series of floral envelopes, occurring in the more highly developed plants. It is situated within the outer of these envelopes called the calyx, and exteriorly to the stamens and pistils. In all cases its divisions, which are called petals, alternate with those of the calyx. They are generally colored—*i. e.*, in botanical language, they are some other color than green. The corolla is, as a rule, larger than the calyx, but in some plants this is not the case. When the petals of a corolla are all distinct, they are said to be polypetalous, which is the normal type of a corolla. When they cohere continuously by their margins they are generally called monopetalous (one-petaled), which is a not quite accurate term; a better one is gamopetalous, meaning that the petals have in a certain sense contracted what may be poetically called a marriage union. The petals of a corolla are really only modifications of leaves. The corolla is not essential to the reproduction of a plant. It shades the productive organs inside it from injury, and, in some cases, by secreting honey attracts bees and other insects to aid in their fertilization.

COROLLARY, a proposition the truth of which appears so clearly from the proof of another proposition as not to require separate demonstration.

COROMANDEL COAST, the E. coast of the Indian peninsula, Madras presidency, or that portion of it between Palk's strait and the Pennar river. It is open, sandy, and has no secure harbors, and the surf renders landing difficult.

COROMANDEL WOOD, the wood of *diospyros hirsūta*, a tree found in Ceylon. Its ground color is chocolate brown, with black stripes and marks; it is hard, turns well, and makes very handsome furniture.

CORONA (a crown), in astronomy, a halo or luminous circle round one of the heavenly bodies; specifically the portion of the aureola observed during total eclipses of the sun, which lies outside the chromosphere or region of colored prominences. In botany, the corona is an appendage of the corolla in some flowers, coming as it were between the corolla and the stamens, well seen in the cup of the daffodil. In architecture, it is the lower member of the projecting part of a cornice. See HALO.

CORONA AUSTRALIS (the southern crown), one of Ptolemy's southern constellations, containing 12 stars.

CORONA BOREALIS (the northern crown), one of Ptolemy's northern constellations, containing 21 stars.

CORONACH, a name formerly used for the funeral dirge among the Irish and Scottish highlanders. The dirge, disused in Scotland, is in Ireland commonly known as the *keen*.

CORONEA, a small town of Bœotia, S. W. of Lake Copais, where in 447 B. C. the Bœotians defeated the Athenians, and in 394 Agesilaus defeated the allied Greeks.

CORONELLA, a genus of *ophidians*, the typical one of the family *Coronellidæ*. *C. austriaca* is common in Europe.

CORONELLIDÆ, a family of *ophidians*, suborder *Colubrina*. They are broad snakes, flat beneath, with the shields of the head regular.

CORONER, a functionary whose name coroner—anciently coronator, from Lat. *corona*—a crown—implies that he has principally to do with pleas of the crown or in which at least the crown is concerned. His office is very ancient, mention being made of it in A. D. 925. His court is a court of record in which, after sight of the body of one who has died in prison, or so suddenly that suspicions of violence may be excited, a jury summoned for the purpose pronounce decision as to the cause of death. "Accidental death" is a frequent verdict, but there are cases in which it is "Willful murder against some person or persons unknown," or an individual is named. In this the proceedings under the auspices of the coroner prepare the way for a criminal prosecution. He also officiates as a sheriff's substitute when the sheriff himself is interested in a suit, and cannot therefore act in it himself. From four to six are appointed for each coun-

ty in England. In the United States the coroner is an elective county officer. His duties are similar to those of a coroner in England.

CORONIS, the daughter of King Phoroneus, whom Neptune loved, and who was changed into a crow by Minerva.

CORONITE, an explosive, consisting of a mixture of nitroglycerin, nitro-cellulose, ammonium nitrate, potassium nitrate, aluminum stearate, rye flour, wood meal, and liquid paraffin.

COROT, JEAN-BAPTISTE-CAMILLE (kō-rō), a French artist; born in Paris, July 28, 1796; studied under Michallon and Victor Bertin and afterward in Italy. He exhibited for the first time in the Salon in 1827, but some years elapsed before the high qualities of his work were recognized. The fortune which he



COROT

inherited from his father enabled him, however, to follow out the bent of his genius, and the last 25 years of his life were a continuous triumph. He frequently painted figure subjects, including the large sacred pictures, the "Flight Into Egypt" and the "Baptism of Christ"; but his most characeristic and successful work was in landscape. Few artists have been so successful in painting light and air, or in infusing work manifestly closely studied from nature with an ideal charm. He died in Paris, Feb. 23, 1875.

COROZO NUT, the seed of a palm, *phytelephas macrocarpa*, a native of tropical America, the hardened albumen of which is used by turners under the name of vegetable ivory.

CORPORAL, formerly a kind of brigade-major, who commanded skirmishing parties detached from the other forces. As now used it means a petty non-commissioned officer ranking immediately under a sergeant, and just above the ordinary rank and file. He has charge of one of the squads of the company, places and relieves sentinels, and keeps good order in the guard.

CORPORAL, a name given to the linen cloth, also called pall and chalice-veil, with which the celebrant covers what is left of the consecrated elements in the Holy Communion till the service is concluded.

CORPORATION, a corporate body legally empowered to act as a single individual, and having a common seal. A corporation may be either aggregate or sole. Corporations aggregate consist of two or more persons legally incorporated in a society, which is kept up by a succession of members, either in perpetuity or till the corporation is dissolved. A corporation sole consists of a single individual and his successors, the intention being to perpetuate a function or office, which cannot be done in any man in his personal or bodily capacity. To render valid a transfer of lands to such a corporation, the phraseology must always include the words "and his successors." In England the king or a bishop is a corporation sole, as the office is immortal though the man may die.

Corporations are liable to the ordinary laws and treaties of the country, but are not citizens in the sense of exercising a political or municipal franchise. United States law has also had occasion to emphasize the distinction between a public corporation which may be affected by legislation, and a private corporation. Further, according to United States law, the franchises of a corporation are treated as realizable assets for creditors. The amount of property which may be held by a corporation in the United States is frequently limited in the act or charter. In the United States less importance is attached to the use of the common seal of a corporation than in Great Britain. In Oregon, Delaware, District of Columbia, South Dakota, and Porto Rico the laws affecting corporations are more liberal and the fees smaller than in most other States.

CORPS (kōr), a body; a word often used as a military and a political term.

A *corps d'armée*, or army corps, one of the largest divisions of an army. In the United States it formerly numbered 25,000 men, but has now been replaced by a Field Army of two or more divisions under a lieutenant-general. The term was abolished in the British army in 1906. *Corps diplomatique*, the body of ministers or diplomatic characters. *Corps législatif* (kōr lā-zhis-la-tēf), the lower house of the French legislature in 1857-1870. Its members were elected for six years in the proportion of one to 35,000 electors.

CORPULENCE, or **CORPULENCY**, grossness or fleshiness of body; excessive fatness; a state of being loaded with flesh. It is impossible to define exactly the limit beyond which the body can be said to be corpulent, depending, as it does, very much on the general habit and the state of health of the individual. It most commonly takes place after the age of 40, but is not confined to any particular period of life, being found also in childhood and youth. The causes of corpulence are both natural and acquired. There are some persons who have a natural tendency to corpulence; in others it may be induced by modes of life, indolent and sedentary habits, and the use of certain kinds of food. The undue accumulation of fat produces a variety of effects, interfering with the vital energies of the body, and incapacitating for exertion. The chances of life are not so great among persons of a corpulent habit as among those of a normal condition. All sudden or violent measures to get rid of corpulence are attended with harm.

Attention to diet, and the avoidance of such articles as tend to generate fat, together with active exercise, and the counteracting of indolent habits, are among the best means that can be employed.

CORPUS CHRISTI, city and county-seat of Nueces co., Tex.; on Corpus Christi bay, at the mouth of the Nueces river, and on the Mexican National, the St. Louis, Brownsville and Mexico, and the San Antonio & Aransas Pass railroads, 140 miles S. S. E. of San Antonio. It is the stock-raising and farming center of the county, and has an extensive fish and oyster-packing business, several daily and weekly newspapers, a Catholic convent, several churches, 2 National banks, etc. Pop. (1910) 8,222; (1920) 10,522.

CORPUS CHRISTI COLLEGE, a college of Cambridge University, England, founded in 1352, when, by reason of the plague, many churches in England were left without priests. To help meet this need two guilds of Cambridge, St. Mary and Corpus Christi, united to found a college to educate clergymen. The members of this college held the services in St. Benet's church, hence the college was known as Benet College. In 1827 its official name was changed to Corpus Christi. In the reigns of Henry VIII. and of Elizabeth, the master of the college was Archbishop Parker, to whom it is chiefly indebted for the valuable collection of monastic records in its possession which were donated to the college upon the dissolution of the monasteries. A large and interesting collection of plate is another of its valuable assets. The main building of the college stands practically the same as it did when erected in the 14th century. Among its many distinguished alumni were the dramatists Marlowe and Fletcher. The college consists of 1 master and 33 fellows, in addition to about 100 undergraduates.

CORPUS CHRISTI COLLEGE, a college of Oxford University, England, founded in 1516, when the humanist movement in Europe was at its height. Its foundation and the provisions governing it are notable in the intellectual history of the university. Richard Foxe, Bishop of Winchester, and Bishop Oldham, of Exeter, were the founders. It was the first college in England to break away from the old scholastic traditions and to establish an endowed chair in Greek. It also admitted all members of the university to the lectures. For these measures, as well as for the emphasis placed on the humanistic studies, it won high praise from Erasmus. Among its many distinguished graduates were Thomas Arnold, Hooker, and Nicholas Udall, the author of the first English comedy. Its present foundation provides for a president, 14 fellows, 27 scholars, and a number of undergraduates. In 1913 the number of the latter was 89, but the war reduced their numbers considerably.

CORPUS CHRISTI FESTIVAL, the most splendid festival of the Roman Catholic Church. It was instituted in 1264, in honor of the Consecrated Host and with a view to its adoration, by Pope Urban IV., who appointed for its celebration the Thursday after the festival of the Trinity. and promised to all the penitents who took part in it indulgence for a period of from 40 to 100 days. The festival is chiefly distinguished by magnificent processions. In France it is known as the *Fête Dieu;* in German, as the *Fronleichnamsfest.*

CORPUSCLE, minute solid microscopic bodies found in the blood. They

are of two kinds, (1) colored corpuscles, known also as the red particles or the red globules; and (2) the colorless, known also as the white or pale corpuscles. The former are the more numerous. The colored corpuscles are not really globular; they are flattened or discoidal, the outline being circular.

In most mammals the corpuscles are like those of man. In the camel, however, they are elliptical in outline. In birds, reptiles, and most fishes they are oval disks with a central elevation on each side. Those of the invertebrata are, as a rule, not colored, the annelids alone being an exception.

CORRAL, in South America and elsewhere, a yard or stockade for cattle.

CORREGGIO, ANTONIO ALLEGRI (kō-redg'yō), commonly called CORREGGIO from his birthplace; born in 1494, and appears to have first studied painting under Tonino Bartolotto of Correggio; in 1519 he was established as a painter at Parma. The celebrated cupola at Parma was begun in 1520, and in 1522 he undertook the great works of the dome of the cathedral; in the former representing the ascension of Christ, and in the latter, the assumption of the Virgin, both of which series are now admirably engraved by the Cavalier Toschi. The frescoes of the cathedral, left unfinished by Correggio, were completed by his pupil, Giorgio Gandini. Correggio died at his native place in 1534. His great reputation rests chiefly on the above-mentioned frescoes; but he had executed many excellent oil pictures before he proceeded to Parma in 1519. The "Night," of Correggio, in the Gallery of Dresden, is a picture of the nativity of Christ, in which the light proceeds from the body of the infant Saviour.

CORREGIDOR, a small island commanding the entrance to Manila bay, P. I. It has an area of 2 square miles, rising abruptly from the sea to a height of 635 feet. There is a lighthouse at the summit. The island was strongly fortified by the Spaniards in the 18th century, but the defenses were not kept up. When Admiral Dewey made his dash into Manila bay, May 1, 1898, he steamed past this island, which was supposed to be very strongly fortified. The forts have been strengthened by the United States Government, which established an arsenal here in 1900. Pop. of San Jose, the only town, 500. South of Corregidor is the smaller island of Caballow, separated by a narrow strait.

CORRESPONDENCE SCHOOLS, schools in which instruction is given by mail to those students who are unable to attend schools and college, either because they cannot afford to stop remunerative labor or because they are too far distant from any good school. Under the system the student, after the payment of fees, receives textbooks and lessons by mail from the institution, returns the completed exercises, and receives them back, corrected and marked. This type of instruction presupposes on the part of the student a conscientious desire to learn and a willingness to work. Such students have been greatly benefited by the correspondence schools. In 1868 the University Extension movement was started in England, the object being to give to mature men and women, who had been deprived of any education in early life, some opportunity to acquire knowledge of science and literature. Probably from this institution, adopted in America in 1873, arose the first correspondence university at Ithaca, N. Y. For a time the Chautauqua, under President William Rainey Harper, undertook to educate by correspondence, but abandoned it when some of the Western universities, such as Wisconsin and Chicago, took over this task. Many of the great Western universities have courses which can be taken by correspondence, and by adopting this method of instruction the State universities gain a hold upon the people of the commonwealth, which in part accounts for the generous support given them by the State Legislatures. One of the most successful correspondence schools in the United States is a private institution, the International Correspondence Schools, located at Scranton, Pa. Not only are the regular college courses offered by this school, but virtually every vocation or trade can be learned by correspondence with this school. In fact, the larger proportion of its students are learning trades, the number of its students who are doing college work being comparatively small.

CORRÈZE, (kō-rāz'), a French department, formed out of part of the old province of Limousin, and taking its name from a river, the Corrèze, flowing 52 miles S. W. to the Vezère. Area, 2,272 square miles. Pop. about 300,000. The chief rivers of Corrèze are the Dordogne, the Vezère, and the Corrèze. The surface of the department is mountainous, especially in the N. and E., where it is broken in upon by offsets from the Auvergne Mountains which, in Mount Odonze, attain a maximum altitude of 3,129 feet above the sea. The lower slopes are clad with forests, but the district is in general sterile. Minerals, particularly coal, iron, lead, alabaster, and

granite of various colors, are found. The department is divided into the three arrondissements of Tulle, Brive, and Ussel. Tulle is the chief town.

CORRIB, LOUGH, a lake of the counties Galway and Mayo, the second largest in Ireland. Lying only 30 feet above sea-level, it is of very irregular shape, 25 miles long from N. W. to S. E., and 1 to 6 broad, with an area of 68 square miles. From its S. end, 4 miles N. of Galway, it discharges its surplus waters by Galway river into Galway bay. It receives the waters of Lough Mask, at its N. end, through the Pigeon Hole and other caves, as well as those of the Clare and other smaller rivers. It contains many islets, and to the W. are mountains 3,000 feet high, while near it are many stone-circles.

CORRIENTES (kor-yen'tēs), a province of the Argentine Republic, between the Paraná and Uruguay rivers, extending from Entre Rios to Misiones territory, with an area of 33,535 square miles. The surface is generally flat, with numerous lakes and swamps, but has undulating stretches along the Paraná and in the E., and is heavily wooded in parts. Lake Ibera, a group of lakes and swamps covering some 1,800 square miles, is surrounded with a jungle, in which the *tacuara* bamboo (30 feet) is conspicuous; and here jaguars and alligators abound. The mean temperature (72° F.) is the highest in the republic, and the extremes (44°—98°) are not so excessive. As in Paraguay, Guarani is the common language, Spanish being employed only by the official and educated classes. Cattle-raising is the chief occupation; agriculture is very backward. Pop. about 350,000. The capital, Corrientes, is almost hidden among orange-groves, 15 miles below the confluence of the Paraná and the Paraguay, and takes its name from seven currents formed by points of rock above the city; vessels of nine feet draught can reach the town at all seasons. Steamers from Buenos Aires (832 miles) touch here. Pop. about 30,000.

CORRIGAN, MICHAEL AUGUSTINE, an American clergyman; born in Newark, N. J., Aug. 13, 1839. He was educated at the Roman Catholic Theological seminaries of St. Mary's and Mount St. Mary's and at the American College in Rome, where he was ordained to the priesthood in 1864. He was made president of Seton Hall College in 1868, Bishop of Newark in 1873; Archbishop of Petra and coadjutor to Cardinal McCloskey in 1880; and Archbishop of New York in 1885. He died in 1902.

CORROSIVES, in surgery, substances which eat away whatever part of the body they are applied to; such are glacial acetic acid, burned alum, white precipitate of mercury, red precipitate of mercury, butter of antimony, etc.

CORROSIVE SUBLIMATE, also called mercuric chloride, $HgCl_2$, bichloride of mercury, perchloride of mercury; prepared by heating mercuric sulphate with dry sodium chloride; the mercuric chloride sublimes as a white transparent crystalline mass, sp. gr., 5.43. It is dissolvable in about 20 parts of cold water, and very soluble in alcohol and ether. It precipitates albumen, hence white of egg is an antidote. It is very poisonous, and is used to preserve both animal and vegetable substances. It is used in pharmacy as *Liquor Hydrargyri Perchloridi*, and as *Lotio Hydrargyri Flava* when mixed with lime. Corrosive sublimate is a powerful irritant, and is used externally in skin diseases. It is administered internally in syphilis, usually in conjunction with iodide of potassium. It is also much in use by surgeons in an antiseptic spray and as a cleansing agent for sterilizing their operating instruments. As an antiseptic wash for wounds or sores its strength is generally used in proportion of one part of the salt to 5,000 of the solvent.

CORRUGATED METAL, metal that has been corrugated to give it increased rigidity and power to resist buckling and collapse. The process is merely an application to metallic substances of the old contrivance of "goffering" or "piping," by means of which frills are stiffened and kept in shape. The metal to be corrugated is passed between pairs of rollers with ridged surfaces, the ridges of one fitting into the hollows of the other, and the sheets or plates operated on are bent and compressed into the wavy outline of the rolls. Walls and roofs of light and temporary buildings are extensively made of corrugated galvanized iron—*i. e.*, sheet-iron first corrugated and subsequently coated with zinc by dipping the sheets into a bath of the liquid metal.

CORRUPT PRACTICES, methods employed in elections to influence the voter or to change the result of the election in an improper manner. The practices alluded to are bribery, making false election returns, making false declaration regarding election expenses, and personation of voters. The English Parliament led the way in putting a stop to these abuses of democratic elections. As early as 1854 it had passed a law against bribery at election, entitled the Corrupt Practices Prevention Act. In

1883 Parliament passed what is probably, even to-day, the most effective and sweeping Corrupt Practices Act. Its main provisions are that it inflicts severe penalties, imprisonment and fine, upon those who practice bribery or "undue influence" upon voters. So broadly has this last phrase been interpreted that an English court has held an entertainment given with the intention of corrupting voters to be a violation of the law. The law further provides for the restriction within very narrow limits of the number of persons paid by campaign committees for their work in the elections; it prescribes a fixed scale of lawful expenditures by candidates or committees, and requires a full and correct account of all expenditures. The United States was slow in following Great Britain in this respect. The opening of the 20th century saw a change for the better, and, by 1920, nearly every State had placed upon its statute book a Corrupt Practices Act. Hardly any of them are as sweeping in their provisions as the English act, but all require the publication of campaign expenses and set penalties for false returns. See ELECTORAL REFORM.

CORRY, a city in Pennsylvania, in Erie co., on the Erie and the Pennsylvania railroads. It is an important industrial center, and has steel works, machine shops, flour mills, and manufactures of locomotives, gas engines, furniture, shovels, toys, etc. It has the State Fish Hatchery. There are a handsome high school and other important public buildings. In the vicinity are mineral springs and petroleum wells. Pop. (1910) 5,991; (1920) 7,228.

CORSET, an article of dress laced closely round the body; a bodice; stays. the corset is one of the most useful and necessary articles of female dress, though many of the worst diseases of the chest have been developed and are frequently greatly exaggerated by tight lacing. Corsets are as necessary to a woman, after a certain stage of life, as a bandage is for a sprain. Stays, or rather corsets, however, are quite uncalled for with growing girls, unless, indeed, there should be some natural deformity or weakness to correct. The idea that such a rigid incasement is requisite to give contour to the bust, and impart a graceful carriage to the figure, is equally erroneous. Up to 17 or 18, or perhaps till her marriage, no young female, if she takes due care of her person, and does not acquire bad habits, has any occasion to wear a corset for the mere sake of support and strength. Whatever is worn up to that time around the chest requires neither whalebone nor steel, nor any tension more rigid than that afforded by strings or straps. But to the mother who has domestic duties to perform, and children to nurse and suckle, the corset becomes an absolute necessity. It is against the universal employment of steel-ribbed stays and tightly-drawn corsets in young women under 20 years, that both authority and reason should be directed to urge the discontinuance of a system decidedly hurtful.

CORSICA, an island in the Mediterranean, forming the French department of the same name. It is separated from the island of Sardinia, on the S., by the Strait of Bonifacio, about 10 miles wide; length, N. to S., 110 miles; breadth, near its center, 53 miles; area, 3,367 square miles. The E. coast is almost unbroken, but on the W. coast a number of deep bays, St. Fiorenzo, Calvi, Porto, Liscia, Ajaccio, and Valinco, follow in rapid succession. The interior is traversed by a mountain chain, the culminating point of which is Monte Cinto, 8,891 feet high, Monte Rotondo coming next with 8,775 feet. From the E. and W. side of the chain numerous streams flow to opposite sides of the coast, generally mere torrents. With the exception of some marshy districts on the E. coast, the climate is very fine. There are fine forests containing pines, oaks, beeches, chestnuts, and cork-trees, and the mountain scenery is splendid. In the plains and numerous valleys the soil is generally fertile; but agriculture is in a backward state. Mules, goats, horses, cattle, and sheep, and among wild animals, the boar, the fox, and the deer, are common. There are good fisheries. In minerals Corsica is not rich. The chief exports are wine, brandy, olive-oil, chestnuts, fruits, and fish. The chief towns, Ajaccio (pop. 19,000) and Bastia (pop. 30,000), are connected by railway. The island was first colonized by the Phœnicians, from whom it got the name of Cyrnos. The Romans afterward gave it that of Corsica. From the Romans it passed to the Goths, and from them to the Saracens, and in the 15th century to the Genoese. France had the rights of the Genoese ceded to her, after Paoli had virtually made Corsica independent, and entered on forcible possession of it in 1768. An insurrection in 1794, headed by General Paoli and assisted by the British, for a time restored the island to independence; but in 1796 it again fell under the dominion of France. Pop. about 289,000.

CORSICANA, a city and county-seat of Navarro co., Tex.; on the Houston

and Texas Central and other railroads; 180 miles N. E. of Austin. It is a great oil district. The city is the seat of the State Orphans' Home and the Odd Fellows' Widows and Orphans' Home, and has street railways, waterworks, daily and weekly newspapers, three National banks, etc. Pop. (1910) 9,749; (1920) 11,356.

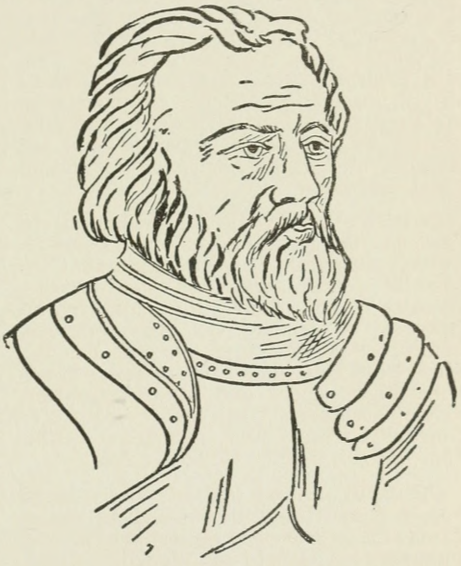
CORSO, an Italian term given to a leading street or fashionable carriage-drive.

CORSON, HIRAM, an American educator; born in Philadelphia, Pa., Nov. 6, 1828. He became Professor of Rhetoric and English Literature at St. John's College, Annapolis, in 1866, and of English language and literature, rhetoric, and oratory in Cornell University in 1870. Among his publications are: a "Hand-Book of Anglo-Saxon and Early English" (1871); "An Introduction to the Study of Robert Browning" (1886); "Jottings on the Text of Hamlet," "Lectures on the English Language and Literature," "The Aims of Literary Study, "Introduction to the Prose and Poetical Works of John Milton" (1899); etc. He died in 1911.

CORTELYOU, GEORGE BRUCE, statesman, was born in New York City, July 26, 1862. He was a general law reporter, private secretary to several public officials, and head master of a school at Hempstead, N. Y. Private secretary to Presidents McKinley and Roosevelt, 1896-1903; Secretary of Commerce and Labor, 1903-1904; Postmaster-General 1905-1907; Secretary of the Treasury, 1907-1909. President of Consolidated Gas Co., New York, after 1909, and a director in numerous corporations.

CORTES, the states or legislative assemblies of the kingdoms of Spain and Portugal, composed of the nobility, clergy, and representatives of cities. They thus correspond in some measure to the British Houses of Parliament.

CORTEZ, or **CORTÉS, HERNANDO**, the conqueror of Mexico; born in Estremadura, Spain, in 1485. At the age of 19 he left Spain, to seek fame and fortune in the new world. He distinguished himself under Velasquez in the conquest of Cuba; and after passing several years in that island he obtained leave from Velasquez to conduct a small expedition to the newly discovered coast of Yucatan and Mexico. With less than 600 soldiers, and 16 horses, 10 cannon, and four falconets, he sailed, in 1519, to conquer the most powerful empire in America. He landed on the Mexican coast on Good Friday, April 21, on the spot where the city of Vera Cruz now stands. He persuaded his followers to destroy their ships, and to march inland, with no prospect but to succeed or perish. The Indian republic of Tlascala lay between him and the Mexican capital. He defeated the Tlascalans when they attacked him, and then succeeded in winning their friendship. They acted thenceforth as his zealous and faithful allies. Alarmed by the reports of the prowess of the Spaniards, and of the superhuman terrors of the arms which they wielded, Montezuma, the Mexican emperor, sought to conciliate the strangers, and received Cortez and his troops in the capital. Though they obtained lavish presents, and received courteous treatment, the treasures which they saw around them inflamed more and more the cupidity of the invaders. The



HERNANDO CORTEZ

sight of the idolatrous rites, and especially of the human sacrifices which the Mexicans practiced, inflamed their religious bigotry; the ambition of Cortez thirsted after absolute conquest, and, by a bold stroke of treachery, he seized the person of the Mexican emperor. Cortez, soon after this, received a material increase of strength from a force which the Viceroy of Cuba had sent to depose him and take him prisoner, but which he partly defeated, and partly persuaded to come over to him.

He now found himself plunged into a most desperate war with the native Mexicans, who rose upon the Spaniards, and assaulted them in their fortified

quarters in the capital. The Mexicans strove with equal courage, and infinitely preponderating numbers, against the superior weapons and discipline of the Europeans, who throughout the struggle were gallantly supported by their Tlascalan confederates. Cortez was now, at last, obliged to evacuate the city, July 1, 1520. Encouraged by this success, the Mexicans followed the Spaniards, and fought the battle of Otumba, in which they were badly defeated. After receiving some re-enforcements, he again advanced upon the Mexican capital. Guatemozin was now Emperor of Mexico, and had learned the inability of his troops to face the Europeans in the open field. He remained within the city, which Cortez besieged. The geographical position of the city, and the great number of native allies who now served under him, enabled Cortez to establish a strict blockade. Many assaults were made, and met with various fortune. Fire and the sword swept away thousands of the Mexicans, but famine was their most fatal foe; and Mexico, on Aug. 13, 1521, surrendered, and the whole of its vast empire became subject to the crown of Spain. Cortez disgraced his triumph by putting the brave Guatemozin to a cruel death, an act of which he is said to have afterward deeply repented. The domestic enemies of the conqueror of Mexico had, meanwhile, been busy in their intrigues against him at the Spanish court, and in 1528 Cortez returned to Spain to face his accusers. He was coldly received, and he could not prevail on Charles V. to continue him in the governorship of Mexico. He returned to America in 1530, a powerful and wealthy noble, but without public authority. He made several brilliant and important voyages of discovery along the Californian and other coasts of the Pacific. In 1540 he finally returned to Spain, where he was treated by his sovereign with ungracious neglect. He died near Seville, Dec. 2, 1547.

CORTISSOZ, ROYAL, an American journalist and art critic, born in New York City. He served as literary editor and art editor of the New York "Tribune," and contributed many articles on art subjects to magazines. He was the author of the lives of Augustus St. Gaudens (1907), and John La Farge (1911), and also edited several works.

CORTLAND, a village and county-seat of Cortland co., N. Y.; on the Tioughnioga river; and the Lackawanna, the Lehigh Valley, and the New York Central railroads; 37 miles S. of Syracuse. It is a farming and manufacturing trade center, and has several wireworks, foundries, machine shops, and manufactories of carriages, stoves, harness, furniture, cash registers, and steel ware. It is the seat of a State Normal School, and has electric lights and railways, several churches, daily and weekly newspapers, 2 National banks, etc. Pop. (1910) 11,504; (1920) 13,294.

CORUNA. See CORUNNA.

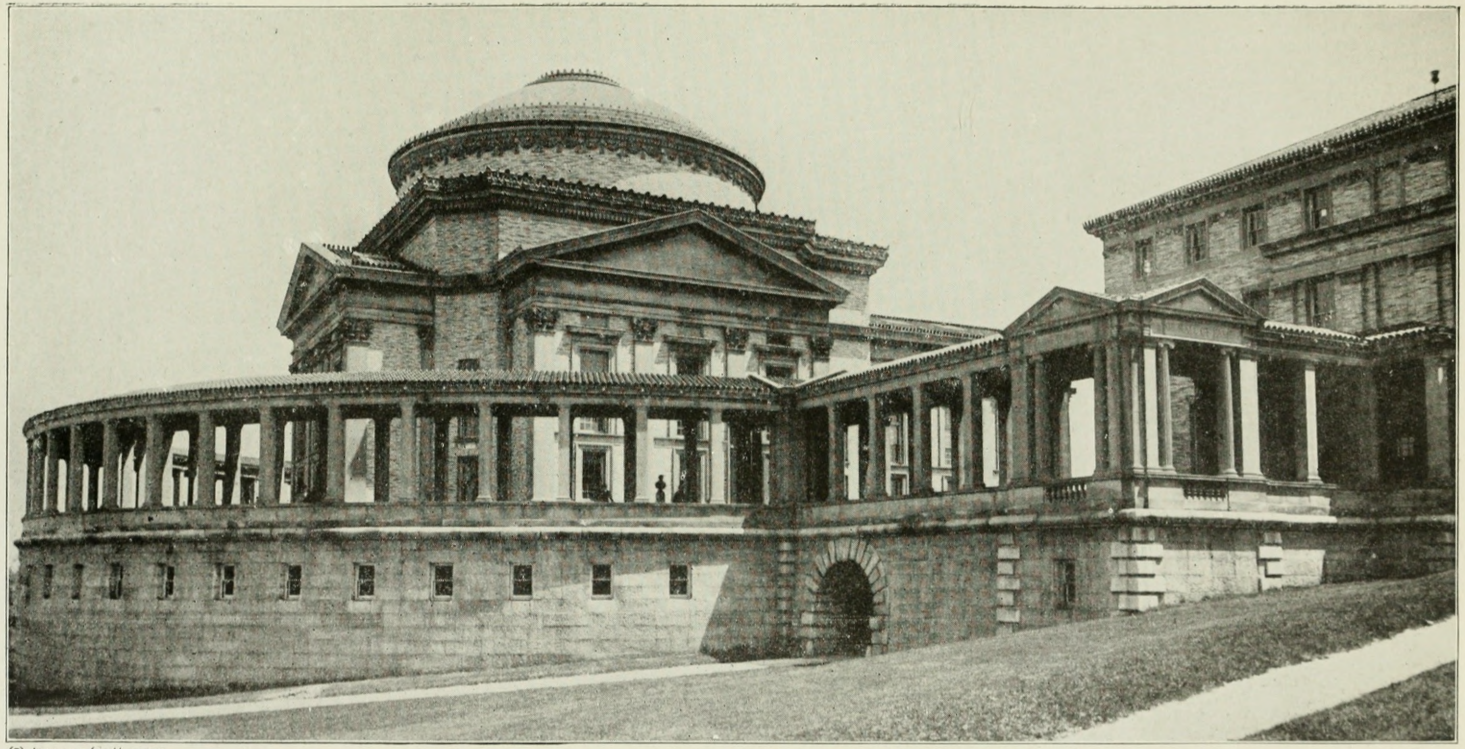
CORUNDUM, a rhombohedral transparent or translucent mineral, very tough when compact. Its hardness is 9, its sp. gr. 3.9-4.16. Its luster is generally vitreous; its colors blue, red, yellow, brown, gray, or nearly white; its streak in all cases colorless. It consists of pure alumina. Chemically viewed, it is aluminum-oxide, Al_2O_3. There are three varieties of it—sapphire, corundum proper, and emery. It includes the species of the genus which are dark in color and only translucent; but its hues may be light blue, gray, brown, or black. The United States imports corundum to the value of $100,000 every year, principally from Canada.

CORUNNA (Spanish *Coruña*), a seaport of Spain, in the province of the same name in Galicia, on the N. W. coast, on a peninsula at the entrance of the bay of Betanzos. It consists of an upper and a lower town, the former built on the E. side of a small peninsula, and the latter on the isthmus connecting the peninsula with the mainland. The harbor, which is well protected, is deep, spacious and safe. Cattle form the chief export. There is a government tobacco factory employing thousands of women and girls. There is a lighthouse, 92 feet high, called the Tower of Hercules, and supposed to be of Roman construction. Corunna was the port of departure of the Spanish Armada (1588), and the scene of the repulse of the French and the death of Sir John Moore (1809). Pop. about 60,000.

CORVÉE, an obligation on the tenants or inhabitants of certain districts to perform certain services for their lord, such as the maintenance of roads, etc.

CORVETTE, a term applied to a flush-deck vessel, ship- or bark-rigged, having only one tier of guns, either on the upper or main deck. The term is no longer used in the navy.

CORVIDÆ, a family of conirostral birds containing the crows and their allies. Their nest is of sticks, lined with soft materials. They may be divided into five sub-families: (1) *streperinæ*, or piping crows; (2) *garrulinæ*, or jays; (3)



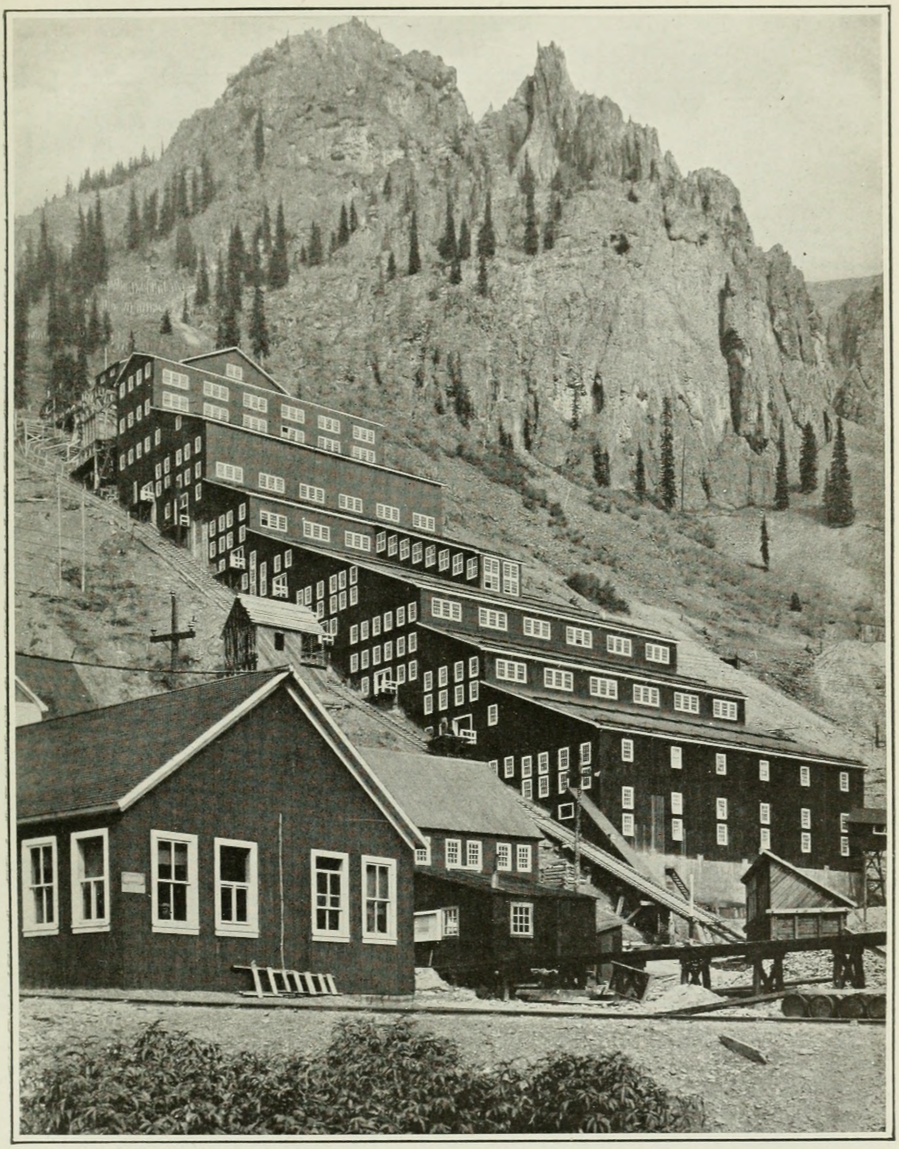
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COLONNADE, HALL OF FAME, NEW YORK UNIVERSITY



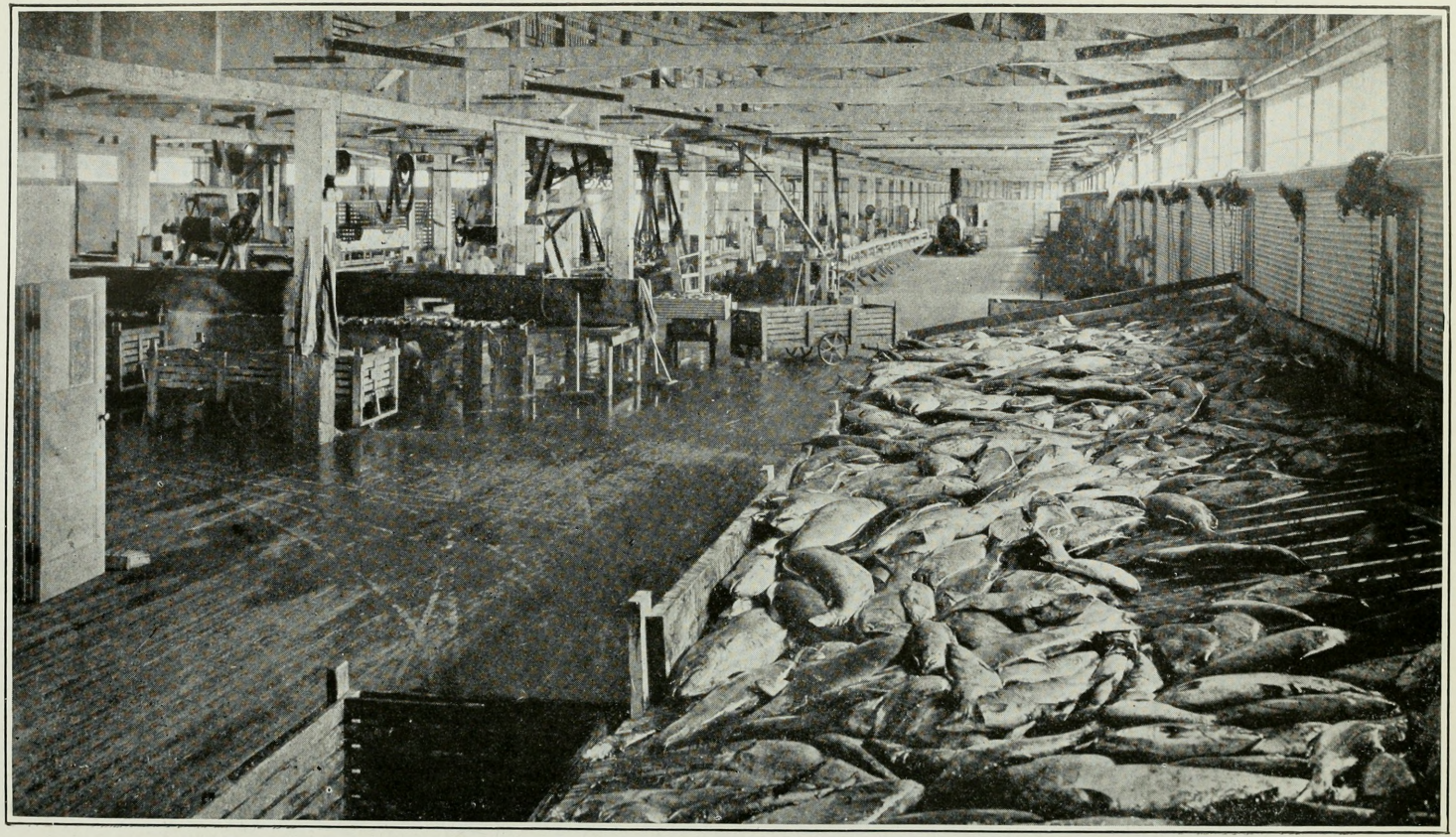
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FALL RIVER IN ESTES PARK. THE PARK IS ABOUT NINETY MILES NORTH OF DENVER, COLORADO

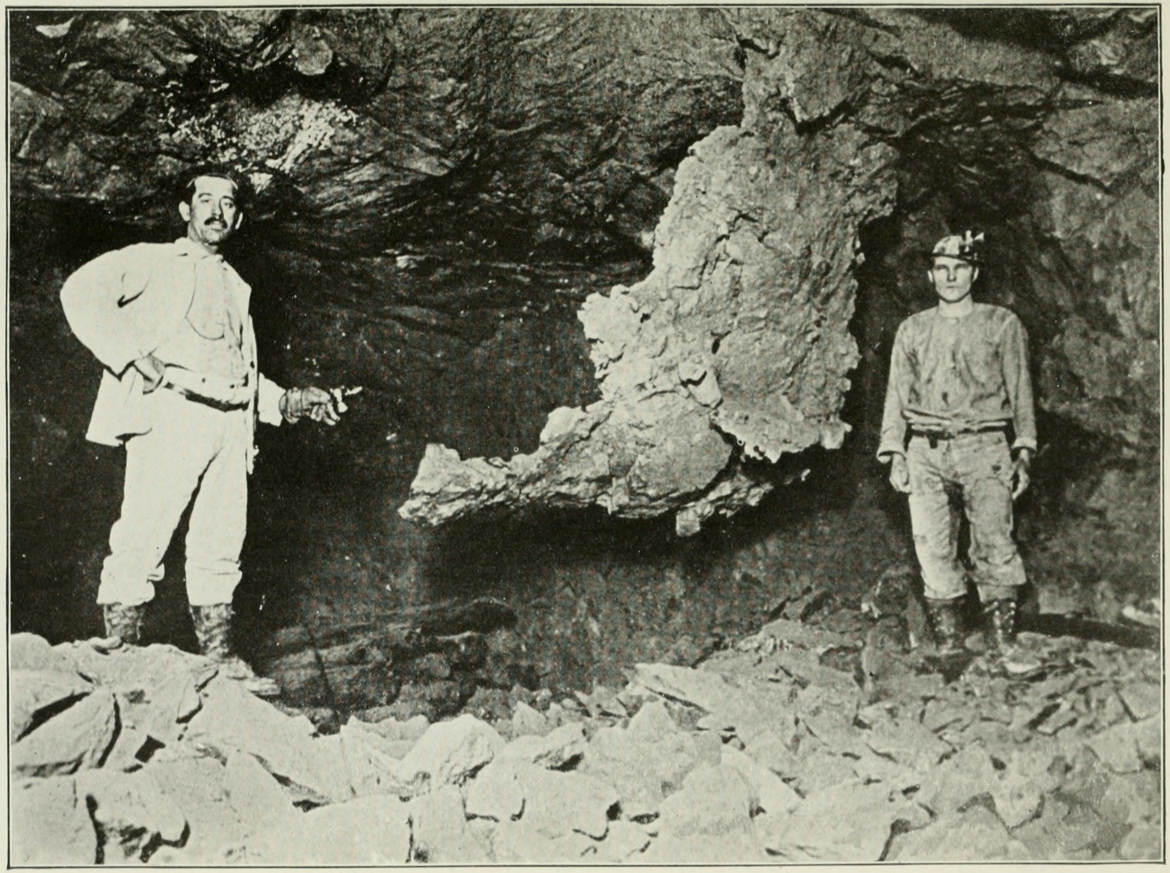


©*Photo by Ewing Galloway*

A "STAMP MILL" FOR CRUSHING ORE, NEAR SILVERTON, COL.

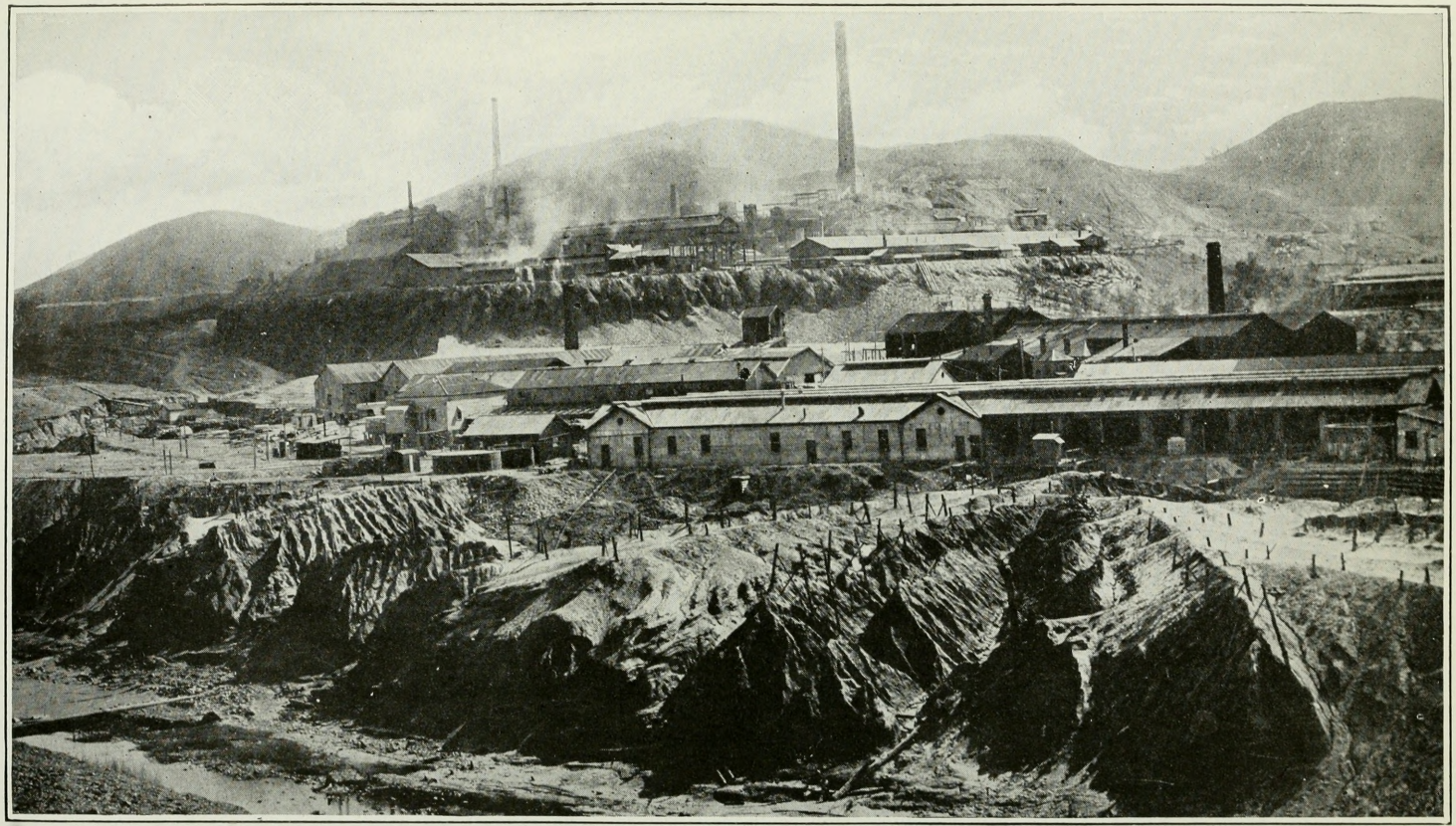


INTERIOR OF A SALMON CANNERY, COLUMBIA RIVER, OREGON



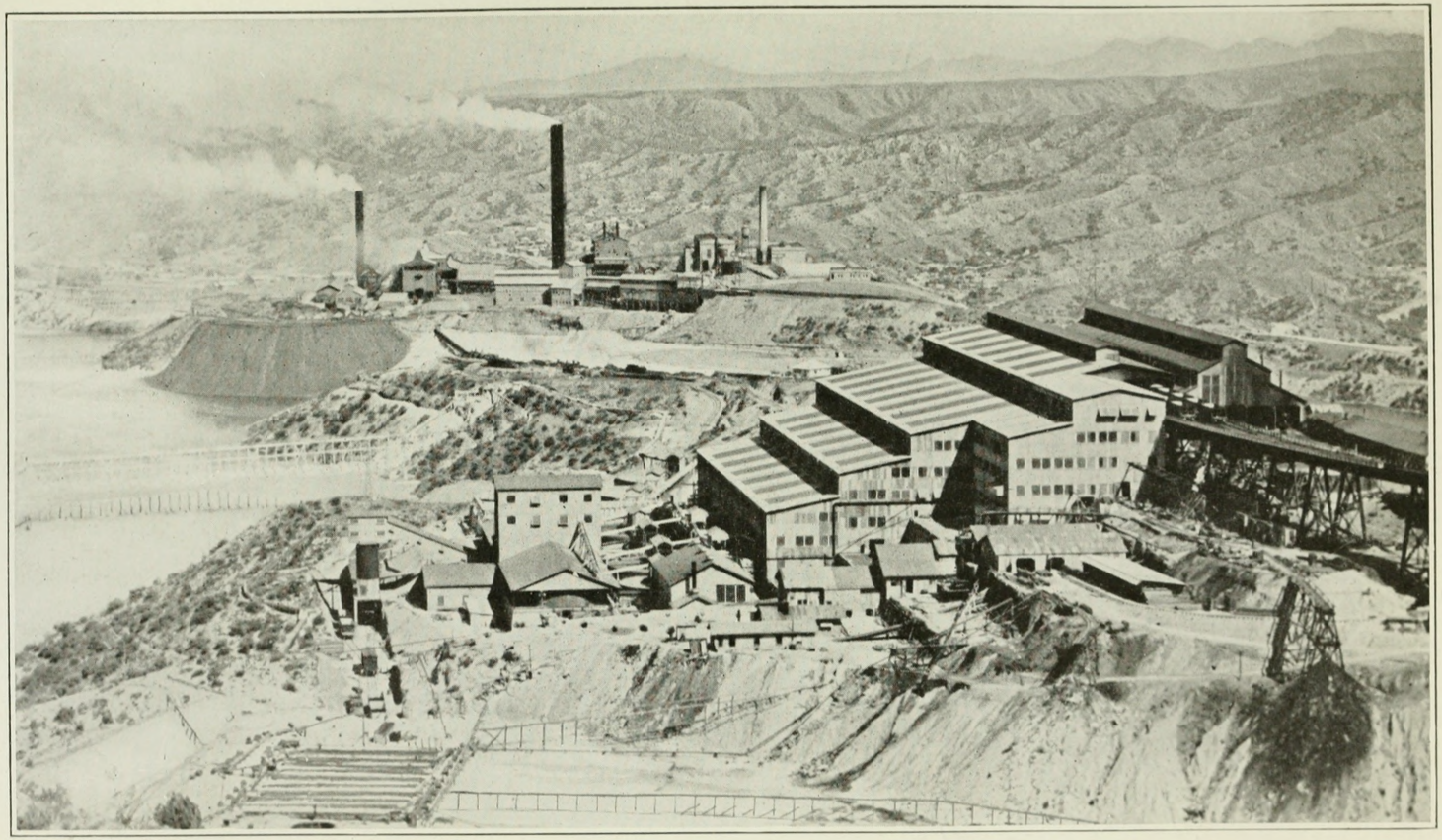
Photo, Ewing Galloway

AN IMMENSE NUGGET OF COPPER IN ONE OF THE MICHIGAN COPPER MINES



Photo, Brown Brothers

A MINE FOR GOLD AND COPPER, MT. MORGAN, QUEENSLAND, AUSTRALIA



©*Ewing Galloway*

A COPPER CONCENTRATION PLANT AND SMELTER, ARIZONA



© *Underwood & Underwood*

A BANANA HARVEST IN COSTA RICA

callæatinæ, or tree crows; (4) *corvinæ*, or true crows, and (5) *pyrrhocoracinæ*.

CORVINUS, MATTHIAS. See MATTHIAS.

CORYLACEÆ, mastworts; an order of diclinous exogens, alliance Quernales. It consists of trees and shrubs with alternate, simple, exstipulate leaves, often with the veins running straight from the midrib to the margin. Male flowers amentaceous, with 5 to 20 stamens; female having the ovary crowned by the rudiments of an adherent calyx; ovary with two or more cells. Among the genera are *carpinus* (hornbeam), *corylus* (hazel), *fagus* (beech), *castanea* (chestnut), and *quercus* (oak). They are found in the temperate parts of the Old and New Worlds. In the tropics they grow chiefly on mountains.

CORYMB, in botany, that form of inflorescence in which the flowers, each on its own pedicel of different lengths, are so arranged along a common axis as to form a flat, broad mass of flowers with a convex or level top, as in the hawthorn and candytuft.

CORYPHÆNA, a genus of *scomberidæ*, or by some it is made the type of a family *coryphænidæ*. The head is greatly elevated, and the palate and jaws both furnished with teeth. *C. hippuris* and several other species are found in the Mediterranean and the adjacent parts of the Atlantic. They pursue the flying fish. The first-mentioned species is one of the two animals called the dolphin.

CORYZA, a synonym for acute nasal catarrh, or "cold in the head." The affection usually subsides without any treatment.

COS, now called STANCHIO or STANKO, an island in the Ægæan Sea, on the coast of Asia Minor; area, 95 square miles; pop. about 10,000. It was the birthplace of Hippocrates, and had anciently a celebrated temple of Æsculapius. In Cos was manufactured a fine, semitransparent kind of silk, much valued by the ancients. Cos is also the name of the principal town, a decayed seaport. The island yields grain, wine, silk, cotton, citrons, etc. It was occupied by Italy in 1912 and afterward restored to Greece. The peace treaty with Turkey awards it to Italy, but when that is signed it will be ceded to Greece.

COSENZA, a town in Calabria, Italy, 43 miles S. W. of Sibari; on a hill between Crati and Busento. Its history goes back to 330 B. C., when it was named as the burial place of Alexander of Epirus. Alaric was killed there in 410 A. D., and it became an archbishopric in the 11th century. It has a fine Gothic cathedral and law courts. Pop. about 15,000.

COSMOGONY, the origin or creation of the world; an investigation or dissertation regarding it. Cosmogony and geology, though having certain relations to each other, are still distinct, cosmogony inquiring into the first origin of things, and geology commencing at a period when, that origin having taken place, successive events in the earth's history began to leave behind them memorials from which their character might be more or less clearly reasoned out.

COSMOS, order or harmony, and hence the universe as an orderly and beautiful system. In this sense it has been adopted by Humboldt as the title of his celebrated work, which describes the nature of the heavens as well as the physical phenomena of the earth.

COSSACKS, tribes who inhabit the southern and eastern parts of Russia, and, previous to the Russian revolution, paying no taxes, but performing instead the duty of soldiers. Nearly all of them belong to the Græco-Roman Church, to which they are strongly attached. They must be divided into two principal classes, both on account of their descent and their condition—the Cossacks of Little Russia and those of the Don. Both classes, and especially those of the Don, have collateral branches, distributed as Cossacks of the Azoff, of the Danube, of the Black Sea, of the Caucasus, of the Ural, of Orenburg, of Siberia, of the Chinese frontiers, and of Astrakhan. Writers are not agreed as to the origin of this people and of their name, but they are believed to be a mixed Caucasian and Tartar race. In personal appearance the Cossacks bear a close resemblance to the Russians, but are of a more slender make, and have features which are decidedly more handsome and expressive.

Originally their government formed a kind of democracy, at the head of which was a chief or hetman of their own choice; while under him was a long series of officers with jurisdictions of greater or less extent, partly civil and partly military, all so arranged as to be able in any emergency to furnish the largest military array on the shortest notice. The democratical part of the constitution has gradually disappeared under Russian domination. Each Cossack, under the Empire, was liable to military service from the age of 18 to 50, and obliged to furnish his own horse. In

1570 they built their principal "stanitza" and rendezvous, called Tcherkask, on the Don, not far above its mouth. As it was rendered unhealthful by the overflowing of the island on which it stood, New Tcherkask was founded in 1805 some miles from the old city, to which nearly all the inhabitants removed. This forms the capital of the country of the Don Cossacks, which constituted, under the Empire, a government of Russia, and has an area of 63,532 square miles, pop. 3,291,000. Their war strength numbers 5,000 officers and 175,000 men. Reserve, 300,000 officers and men. See RUSSIA.

COSSUS, a genus of nocturnal *lepidoptera*, family *hepialidæ* or ghost-moths. They have long, slender, half-serrate antennæ, a small head, and the upper wings longer than the lower ones. The larvæ feed on wood, the pupa is inclosed in a cocoon. *C. ligniperda* is the goat-moth, so called because its larvæ emit a disagreeable smell, as the goat does. It is a large moth, the upper wings gray mottled with white, and having moreover black bands; the lower ones brownish ash; the body brownish gray, with silvery lines. The ground color of the larva is yellow. It takes three years to come to maturity.

COSTA RICA, a republic of Central America; bounded on the N. by Nicaragua; E. by the Caribbean Sea; S. by Panama; W. by the Pacific Ocean; area, 32,000 square miles; pop. (official estimate, 1918) 459,423; capital, San Jose, 38,000.

Topography.—The interior of the country is very mountainous, the ranges reaching an altitude of 11,000 feet, and having many volcanoes. The highest point is Pico Blanco, 11,800 feet. There are many small rivers, the drainage usually being N. E. or S. W., and the fall great. The principal rivers are the Tempisque, Colorado, and Rio Grande. The coast is very irregular, being indented by many large gulfs and bays, of which the Gulfs of Nicoya and Dulce are the most important. The Nicaragua Lake forms nearly half the N. boundary. The E. coast is a gradual slope and is heavily wooded, while the W. is covered with immense savannahs.

Climate and Productions.—The climate in the interior is temperate, and that on the coasts averages about 80° up to an altitude of 3,000 feet. The rainy season on the W. slope lasts from April to November. The soil is exceedingly fertile, and the forests are extensive, yielding mahogany, cedar, rosewood, lignum-vitæ, granadilla, ebony, Brazil-wood, and caoutchouc. Nearly all tropical fruits abound, including coffee, cocoa, banana, sugar, sarsaparilla, and vanilla. Other important productions are tobacco, rice, barley, dye woods, and cotton. The mineral resources are quite extensive, but as yet they have not been systematically worked. Gold is the principal metal mined, and is found both in rock and in placers. Silver, lead, and copper also exist in large quantities. Cattle raising is carried on to a large extent.

Commerce.—The principal exports in 1919 were coffee, 30,784,184 bags; bananas, 7,129,655 bunches (1918). Hard woods, hides, and skins are also exported considerably. There are about 3,300 factories. The imports consisted of merchandise, flour, machinery, oil, cotton, iron, woolens, and worsteds.

Communications.—There are about 435 miles of railway, including branches and sidings. The Port of Limon is visited by steamers of British, American, and Italian steamship companies. The Pacific port of Punta Arenas is also visited by steamers of three lines. Limon and Panama are connected by wireless telegraph, as are Bluefields in Nicaragua and Colon in Panama. There were in 1919 about 2,300 miles of telephone in the country.

Finance.—The revenue in 1919 was about $4,600,000, and the expenditure slightly less. The chief sources of revenue are customs, liquors, railways, postage, and telegraphs. The chief items of expenditure are administration, public instruction and internal development.

Government.—The government is purely republican in form. The president and vice-president, since 1918, are elected by an electoral college of senators and deputies for a term of four years. The president is assisted by a cabinet of six secretaries, appointed by him. The legislative power is vested in a Chamber of Representatives, termed Constitutional Congress on a basis of one representative to every 8,000 inhabitants, chosen in electoral assemblies, the members of which since the Law of August, 1913, are elected by the suffrage of all who are able to support themselves. The members of the chamber are elected for four years, one half retiring every two years.

Religion and Education.—The Roman Catholic is the state religion, but there is entire religious liberty under the constitution. In 1918 there were 315 elementary schools, a lyceum for boys, a college for girls, a normal school and colleges for medicine, law, and dentistry. Public instruction in all branches is rigidly enforced.

History.—Costa Rica was discovered

by Columbus in 1502 and settled in 1504. During the Colonial period it was part of the Kingdom of Guatemala, which proclaimed independence in 1821. From 1824 to 1839 it was a state in the United Provinces of Central America. On the dissolution of the latter, it became an independent republic. In 1856 it declared war on the troops under the filibuster William Walker and defeated them. Its constitution is a most liberal one. Foreigners enjoy every civil right without being admitted to citizenship or being compelled to contribute heavy sums. Admission to citizenship may be applied for at any time and will be granted after one year's residence. Settlers are not obliged to become naturalized citizens. They can carry on business and manufacture, possess real estate, buy and sell, navigate the rivers and coasts, exercise their religious creeds, marry, and dispose of their property by will. Although from time to time minor revolutions have taken place, the population is homogeneous and progressive.

A revolution in January, 1917, resulted in the deposition of President Gonzales. The former Secretary of War, Pinoco, was put in his place. Gonzales fled to Havana. The government broke off diplomatic relations with Germany on Sept. 1, 1917, and took steps to intern all German residents. On May 23, 1918, war was declared against Germany. On Aug. 4, 1919, Pinoco abandoned the task of ruling the country and fled from the revolutionists who had defeated his army. The National Assembly nominated Julio Acosta as provisional president, but he was shortly after succeeded by S. Barquero. On Aug. 23, 1920, the right of suffrage was granted to all citizens of Costa Rica, including women. Those who would exercise the right must be able to read and write, and must be citizens by birth, naturalization, or adoption.

COSTMARY, or **ALECOST**, a composite herbaceous plant, a hardy perennial, a native of Italy, introduced into Britain in 1568, and common in almost every rural garden. It was formerly put into ale to give it an aromatic flavor, hence the name alecost.

COSTS, in law, are the expenses incurred by the plaintiff and defendant. As a rule these are paid by the loser in a suit, but there are always extra-judicial expenses incurred by both parties, which each has to pay whatever be the issue of the suit. In criminal cases, the party accused may have his expenses if the court thinks the accusation unreasonable. In matrimonial suits, the wife, whether petitioner or respondent, is generally entitled to her costs from the husband.

COSTUME, the style of attire characteristic of an individual, community, class, or people; the modes of clothing and personal adornment which prevail in any period or country. Costume balls, also called fancy dress balls, are entertainments at which the guests adopt a style of dress different from the one usually worn.



COSTUME

1. 14th Century
2. 16th Century (Spanish)
3. 16th Century (English)
4. 17th Century

CÔTE D'OR (kōte-dor), an E. department of France, formed of part of the old province of Burgundy; area, 3,392 square miles. The surface is in general rather elevated, and is traversed by a

chain of hills forming the connecting link between the Cevennes and the Vosges. A portion of that range, called the Côte d'Or (golden slope), receives its name on account of the excellence of the wines produced on its declivities. A great part of the department is covered with forests. The valleys and plains are fertile, and there is good pasture land; but the vine culture is by far the most important branch of industry. To this department belong the first-class wines of Clos Vougeot, Romanée, Chambertin, Corton, Richebourg, Volney, Pomard, Beaune, Montrachet, and Meursault. Côte d'Or is watered by the Seine, which rises in the N. W., and by several of its affluents; by the Saone, and by Arroux, a tributary of the Loire. The climate is temperate; iron, coal, marble, gypsum, and lithographic stones are found, the first in large quantities. Côte d'Or is divided into four arrondissements, viz., Beaune, Châtillon-sur-Seine, Dijon, and Semur, with Dijon for its capital. Pop. about 356,000.



COSTUMES—18TH AND 19TH CENTURIES

1. Early 18th Century
2. 18th Century
3. 18th Century
4. Early 19th Century

CÔTES-DU-NORD (kōt-dü-nōr), a maritime department in the N. of France, forming part of ancient Brittany; capital, Brieuc. Area, 2,659 square miles. The coast extends about 150 miles, and the herring, pilchard, and mackerel fishing is actively pursued. One of the main branches of industry is the rearing of cattle and horses. In manufacturing industries the principal branch is the spinning of flax and hemp, and the weaving of linen and sail-cloth. Among the minerals are iron, lead, and granite. Pop. about 605,000.

COTINGA, a genus of *ampelidæ* (chatters). They have beautiful plumage, and are found in South America.

COTISE, or **COST**, in Heraldry, one of the diminutives of the Bend.

COTNER UNIVERSITY, a coeducational institution in Bethany, Neb.; organized in 1889, under the auspices of the Disciples of Christ; reported at the end of 1919: Professors and instructors, 25; students, 387; president, Andrew D. Harmon, A. M.

COTONEASTER, a genus of plants, order *Pomaceæ*. The flowers are polygamous, the calyx turbinate, with five short teeth; petals five, stamens erect, as long as the teeth of the calyx; fruit turbinate, its nuts adhering to the inside of the calyx, but not united in the center of the fruit. *C. vulgaris* is the common cotoneaster. Several varieties of it are cultivated in gardens. Other species are from the European continent, from India, etc.; some of them also have been introduced into Great Britain. *C. Uva Ursi* and *microphylla* have acid in their seeds.

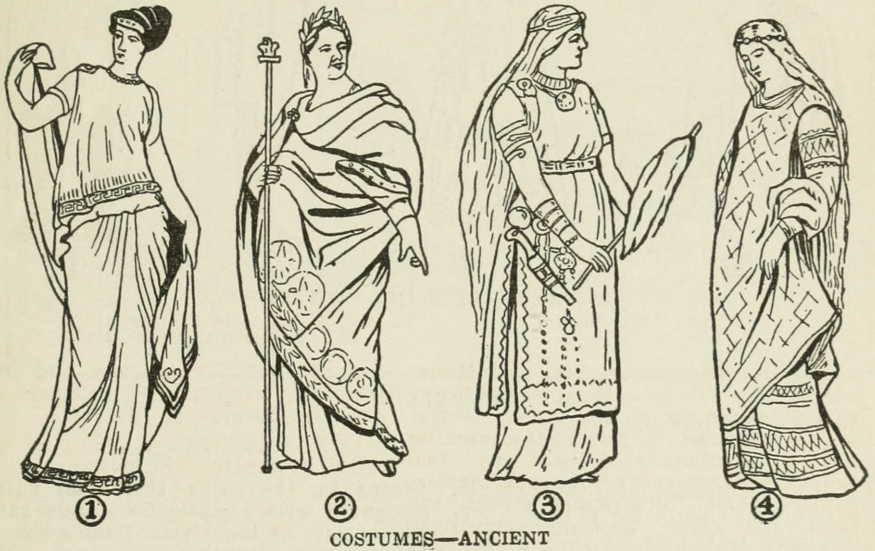
COTOPAXI, the most remarkable volcanic mountain of the Andes, in Ecuador, about 60 miles N. E. of Chimborazo; lat. 0° 43′ S.; lon. 78° 40′ W.; altitude, 19,500 feet. It is the most beautiful of the colossal summits of the

Andes, being a perfectly symmetrical truncated cone, presenting a uniform, unfurrowed field of snow of resplendent brightness. Several terrific eruptions of it occurred in the course of the 18th and the beginning of the 19th century. The most recent eruption was in 1903.

COTSWOLD HILLS, a range of hills in England, county of Gloucester, which they traverse N. to S. for upward of 50 miles; extreme elevation near Cheltenham, 1,134 feet. The Cotswold sheep are a breed of sheep remarkable for the length of their wool.

COTTON, a vegetable hair or filament constituting the wing of the seed of the different species of *Gossypium*, a plant belonging to the order of *Malvaceæ*, growing both in the temperate and tropical climates, indigenous in Asia, Africa, and South America. Both fiber and seed are produced in pods not unlike the outer shell of the walnut. When the seed approaches maturity the fiber in which it is enveloped, which had previously been in a cylindrical form filled with watery sap, becomes dry. The sap is then deposited upon the walls of the outer cell, which then collapses longitudinally and takes on a spiral form slightly blunt at the point where it is attached to the seed, and pointed at the end. In the green-seed variety, the one chiefly cultivated, it is of a white or yellowish hue, soft, flexible, and a non-conductor of heat. The fiber consists chiefly of carbonaceous material drawn from the atmosphere, and is one of the purest forms of cellulose. Although cotton-seed, which is produced at the ratio in weight of two and a half to three parts of seed to each one of fiber, has long been the source of valuable oils and food for cattle in Egypt and India, the cotton-seed of the United States was in former days mostly wasted. It has now become a secondary product of very great value. Tree cotton (*G. arboreum*) is found in India, China, Egypt, on the W. coast of Africa, and in some parts of America, especially in the West Indies. It only attains the height of from 12 to 20 feet; but another cotton-bearing tree (*bombax ceiba*), seen in the West Indies and elsewhere, familiarly called the umbrella tree, attains the height of 100 feet. The produce of the latter, however, is of a short and brittle fiber. Being unfit for spinning, it is only useful for stuffing pillows and beds. Shrub cotton (*G. religiosum*) occurs in one or other of its varieties throughout the tropical parts of Asia, Africa, and America. In appearance it resembles a currant-bush. Its duration varies acording to the climate; in the hottest countries it is perennial, while in cooler places it becomes an annual. The Guiana, Brazil, and most of the West India cotton, is of this kind, the whole being long-stapled.

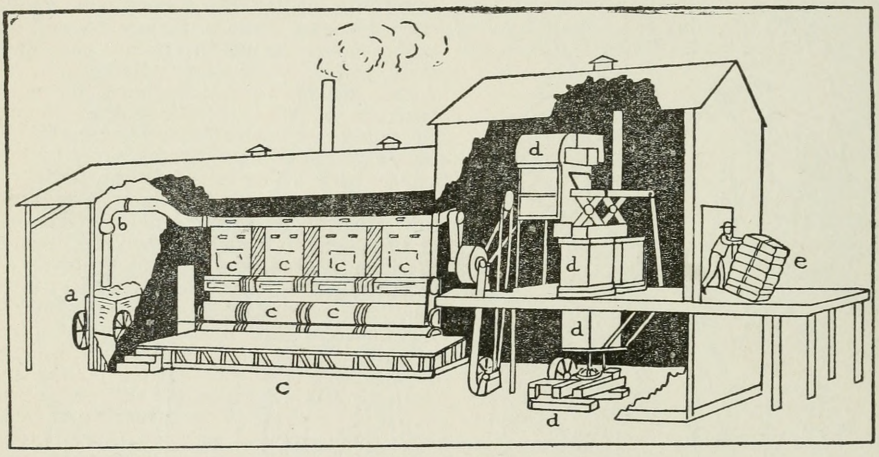
Herbaceous cotton (*G. herbaceum*), commonly called the green-seed variety, is far the most useful and important of the three kinds noticed. It is an annual plant cultivated in the United States,



COSTUMES—ANCIENT

1. Greek
2. Roman
3. Early German
4. 13th Century

India, China, and many other countries. It attains the height of 18 or 24 inches. The seed is usually planted in rows in March, April, and May; the cotton is gathered by hand within a few days of the opening of the pods, in August, September, and October; in the United States often through November and December, or even till it becomes necessary to prepare the land for a new crop. It is to this kind that planters mainly confine their attention in the United States. In places where cotton is more extensively cultivated the following varieties are commonly distinguished: (1) Nankeen cotton, abundant in produce, the seed covered with down, the wool of a dirty yellow color, and usually low-priced. (2) Green-seeded cotton, which, as well as the former, is grown in upland and middle districts, whence the



COTTON GIN

A. Wagon with raw cotton
B. Vacuum pipe to draw cotton into gin
C. Gin
D. Press
E. Cotton bale

latter is called upland, also short-staple, and, from the mode in which it was formerly cleaned, "bowed Georgia cotton." This kind was at first chiefly raised in Georgia and South Carolina, but in later years its cultivation has been very greatly extended throughout the Southern States. (3) Sea-island, or long-stapled cotton, the finest of all, is distinguished by the black color of its seed, and the fine yellowish-white, strong and silky long staple by which it is surrounded; it is grown in the lower parts of Georgia and South Carolina, near the sea, between Charleston and Savannah, and on small islands adjoining the shore and in Florida.

All the varieties of the plant require a dry and sandy soil. Marshy ground is wholly unfit for it, and a wet season is destructive to the crops, which are besides precarious from the disease to which the plant is subject, particularly blight. In general it flourishes most luxuriantly and yields produce of the best quality on the coast, as is proved by the growth of the sea-island cotton, which is mostly exposed to the action of the ocean's spray; and a manure of soft mud is known to impart a healthful action to the plant and to produce a staple at once strong and silky. To this rule, however, the fine Pernambuco cotton is an exception; also the Egyptian, the growth of the upper provinces being greatly superior to that of the Nile Delta. In the United States by special cultivation two, three, and even four bales of 500 pounds each can be made on a single acre.

The cotton production of the United States in 1920 was 12,987,000 bales, compared with 11,421,000 bales in 1919. The total acreage was 36,383,000 in 1920, compared with 33,566,000 in 1919. The total farm value of the 1920 production was $914,590,000, compared with a value of the 1919 crop of $2,034,658,000. The increased value of the 1919 crop is due to the unusually high prices received for cotton. Industrial conditions in 1920 produced a lessened demand and consequently lesser price.

The States producing the largest yields in 1920 were as follows: Texas, 4,200,000 bales; South Carolina, 1,530,000 bales; Oklahoma, 1,300,000 bales; Georgia, 1,400,000 bales; North Carolina, 840,000 bales; Mississippi, 885,000 bales; Alabama, 660,000 bales.

There were imported to the United

States in 1920 345,314,126 pounds of unmanufactured cotton, valued at $156,-918,719. The largest quantity of this was received from Egypt. Other countries from which cotton was imported were Mexico, Peru, China, and British India. There were exported from the United States in 1920 6,915,408 bales, weighing 3,543,743,487 pounds, valued at $1,381,707,502. In 1919 there were exported 5,353,895 bales, valued at $873,-579,669. Cotton growing has been greatly developed in recent years in Egypt. In 1919 there were grown about 1,188,000 bales of 500 pounds each. The Brazilian crop in the same year was estimated at 1,600,000 bales; the Mexican crop at 120,000 bales; and the Spanish crop at 11,200 bales. The world's production of cotton in 1918 was approximately 18,000,000 bales of 500 pounds each, and the consumption for the year 1919 was approximately 15,970,-000 bales. The total number of spindles in the world was placed at 150,000,000.



THE COTTON PLANT

South Africa is undoubtedly destined to become a large producer of cotton. About 12,000 acres were planted in 1919.

Cotton is affected by a variety of insect pests and stringent measures have been taken in recent years to destroy these. The bollworm and the bollweevil are especially destructive. A World's Cotton Conference was held in New Orleans in 1919 with the purpose of adopting the uniform size of the bale, finding new sources of cotton, and bringing about uniform classification, etc. According to data submitted at this conference there were more than 6,000,000 persons engaged in the cotton industry throughout the world and about $20,-000,000 was invested in the growing, sale, and manufacture of cotton.

COTTON-GRASS, a name given to the species of the genus *Eriophorum*, because of their fruit being clothed at the base with a silky or cotton-like substance. It really belongs, not to the grasses, but to the sedges (*Cyperaceæ*). There are several species; the most common is *Eriophorum angustifolium*, the narrow-leaved cotton grass. Paper and the wicks of candles have been made of its cotton, and pillows stuffed with the same material. The leaves were formerly used in diarrhœa, and the spongy pith of the stem for the removal of tapeworm.

COTTON INSECTS. There are a great many insects that do injury to cotton, among them the cotton worm, the budworm, the bollworm, the yellow bear, the io, and the bogworm. Perhaps the most injurious of these is the cotton worm, the ravages of which first began to be noticed in the United States early in the last century. The insect is the larva of a nocturnal moth, and is thought to have had its origin in South America. Its destructions have sometimes covered whole districts, a Government report of 1879 estimating the loss due to its despoliations as averaging nearly $20,000,000 each season. The moth makes its journeys during the night and deposits eggs on the leaves of the cotton plant, the hatching taking place at the end of a couple of nights. The caterpillars then begin their ravages, eating up the leaves and passing from one district to another. Following a period of about sixteen days the caterpillar begins to enter the chrysalis stage, following which the female moth begins to lay eggs totaling into hundreds during the season. The generations sometimes amount to seven in a season in districts favorable to the insect, about four weeks separating one generation from another. Following the cotton worm, the budworm appears to approach next in destructiveness. It resembles the cotton insect in its various stages, being hatched on the plant and living largely on flowers and bolls. It breeds in the winter as well as in the summer, the first three generations living chiefly in the cornfield, the fourth generation making its appearance on the cotton plant. Beetles, fleas, and bugs of various kinds are also apt to do damage to the plant. The capsid or cotton flea is a cause of apprehension in some districts. The red bug or stainer is apt to

have an injurious effect on the cotton fiber, not only sucking the sap from the bolls, but ejecting also a liquid which leaves an indelible stain, greatly lowering the value of the fiber. Continued experiment has resulted in the discovery of methods of counteracting the destructive power of the varieties of cotton insects, and these, aided by their natural enemies, tend to lessen the damage each successive season.

COTTONSEED OIL, an oil obtained from the seed of the cotton-plant, which is crushed between powerful rollers. It is used chiefly as an adulterant for other more expensive oils, as linseed-oil and olive-oil, and for packing sardines, etc. There are about 900 mills in operation in the United States engaged in extracting oil, preparing oil cakes, etc. Oil production about 5,000,000 gallons (1920).

COTTUS, a genus of fishes, by some made the type of a family *Cottidæ*, by others placed under the *Triglidæ* or *Gurnards*. The head is large, depressed, furnished with spines or tubercles; there are teeth in front of the vomer and in both jaws; there are two dorsal fins; the anal fin is small; the body is without scales. Yarrell enumerates four species: *C. gobio*, the River Bullhead, Miller's Thumb, or Tommy Logge; *C. scorpius*, the Sea Scorpion or Short-spined Cottus; *C. bubalis*, the Father Lasher or Long-spined Cottus; and *C. quadricornis*, the Four-horned Cottus. In this country there are several representatives of the species called indifferently bullhead and catfish.

COTYLEDON, a genus of plants, order *Crassulaceæ*. Calyx, 5-partite; petals, united into a tubular or campanulate corolla; stamens 10, inserted in the tube of the corolla. *C. umbilicus* is a succulent plant with pendulous cylindrical flowers of a yellowish-green color. It is from 6 to 12 inches high.

The word is also applied to the first leaf, or one of the first two leaves, developed in a plant. In exogens two such leaves are present in the embryo of every plant, while in endogens there is one. In exogens the two cotyledons are always opposite; in endogens the second leaf developed is alternate with the first. On these distinctions or their absence have been founded three primary divisions of the Vegetable Kingdom, viz., *Dicotyledons*, *Monocotyledons*, and *Acotyledons*. Sometimes, though rarely, there are more than two cotyledons: thus the *Boraginacæ* and the *Brassicaceæ* have four, and the *Coniferæ* 10, 12, or even 15; hence the term *Polycotyledons* has been used. In some cases they are absent; at other times they cohere instead of unfolding.

COUCAL, or **LARK-HEELED CUCKOO**, a genus of common bush-birds in Africa, India, and through the Malayan Archipelago to Australia. The hind-toe is prolonged into a very long spur. Their call is loud and in some cases apparently ventriloquistic.

COUCHANT, in Heraldry, a beast lying down, with his head up. If the head is down, he is dormant.

COUCH GRASS, a grass (*Triticum repens*) sometimes called in books creeping wheat-grass. It has long spikes, the spikelets with four to eight flowers. It is very common in fields and waste places. When occurring as a weed in cornfields, its long, creeping root renders it difficult of extirpation. Couch grass is a diuretic and aperient, and is useful in cases where the mucous membrane of the urinary tract is irritated or inflamed, as in irritation of the bladder, gonorrhœa, etc.

COUDERT, FREDERIC RENE (kö-där'), an American lawyer and expert in international law; born in New York in 1832, was graduated at Columbia College in 1850, and admitted to the New York bar in 1853. In 1892 he was appointed one of the counsel on the part of the United States before the Bering Sea Tribunal of Arbitration in Paris, and was especially complimented by Baron de Courcel, president of the tribunal, for his argument on the necessity of putting a stop to pelagic sealing. On Jan. 1, 1896, President Cleveland appointed him a member of the Venezuela Boundary Commission. He had a world-wide reputation as an advocate and an authority on international law, and several times declined the offer of appointment to the bench of the United States Supreme Court. He was legal representative of the French Government for many years. He died Dec. 20, 1903.

COUES, ELLIOTT (kouz), an American naturalist; born in Portsmouth, N. H., Sept. 9, 1842. He was of late years connected with the Smithsonian Institute, and was author of "Key to North American Birds" (1872), "Field Ornithology" (1874), "Check-List of North American Birds" (1882), "Biogen," "The Dæmon of Darwin," etc. With J. S. Kingsley, he edited the "Standard Natural History" (three vols., 1883). He was actively interested in Theosophy. He died Dec. 26, 1899.

COUGAR, the name given in Brazil to the puma, formerly called the American lion, and now the American panther.

It extended formerly throughout a great part of both North and South America; but it has been destroyed through a great part of the former, except its most southerly portions. It is the *Felis concolor* or the *Puma concolor* of naturalists.

COUGH, a spasmodic effort, attended with noise, to expel from the air passages of the lungs some foreign body or irritating matter, which else would injure the delicate respiratory apparatus. Properly speaking it is not a disease; it is the effort of nature to remove what, if it be allowed to remain, may generate one; or it may be the symptoms of a disease of the lungs, the liver, the stomach, or the intestines; or may be produced by the over-excitability of the system in the nervous temperament. At the same time, when itself violent, it may produce morbid effects.

COULTER, JOHN LEE, an American statistician, born in Mallory, Minn., in 1881. He graduated from the University of North Dakota in 1904 and took post-graduate courses at the University of Wisconsin and the University of Minnesota. He served on the faculties of several colleges and universities, becoming, in 1909, professor of rural economics at the University of Minnesota. In 1910-1912 he was expert special agent of the United States Census Bureau and was in charge of the Division of Agriculture from 1912 to 1914. From 1915 he was dean of the West Virginia College of Agriculture and director of the experimental station. He served as lecturer on agricultural subjects in several colleges and was on the editorial staff of several statistical and economic journals. In 1918-1919 he was a member of the American Overseas Educational Commission. He was a member of many economic societies and was the author of "Economic History of Red Valley of the North" (1910); and "Co-operation Among Farmers" (1911).

COUMARIN, in chemistry ($C_9H_6O_2$, or $C_6H_4\begin{cases}CH=CH\\O-CO.\end{cases}$) occurs in the tonka-bean, the fruit of Coumarouna odorata, in small white crystals, between the seed-coating and the kernel; also in Woodruff, Asperula odorata, and in the leaves and flowers of sweet-scented vernal grass, anthoxanthum odoratum, and other plants. It has been prepared synthetically by heating salicylic sodium aldehydes with acetic anhydride, sodium acetate being produced at the same time. Coumarin is extracted from the tonka-bean by strong alcohol; it crystallizes in colorless rectangular plates, melting at 67°. It is nearly insoluble in water, has an aromatic odor and a burning taste, and is soluble in alcohol and ether.

COUNCIL, an assembly met for deliberation, or to give advice. The term specially applies to an assembly of the representatives of independent Churches, convened for deliberation and the enactments of canons or eccleciastical laws. The four general or œcumenical councils recognized by all Churches are: 1, the Council of Nice, in 325, by which the dogma respecting the Son of God was settled; 2, that of Constantinople, 381, by which the doctrine concerning the Holy Ghost was decided; 3, that of Ephesus, 431; and 4, that of Chalcedon, 451; in which two last the doctrine of the union of the divine and human nature in Christ was more precisely determined. Among the principal Latin councils are that of Clermont (1096), in the reign of Urban II., in which the first crusade was resolved upon; the Council of Constance, the most numerous of all the councils, held in 1414, which pronounced the condemnation of John Huss (1415), and of Jerome of Prague (1416); the Council of Basel, in 1431, which intended a reformation, if not in the doctrines, yet in the constitution and discipline of the Church; and the Council of Trent, which began its session in 1545, and labored chiefly to confirm the doctrines of the Catholic Church against the Protestants. On Dec. 8, 1869, an œcumenical council, summoned by a bull of Pope Pius IX., assembled at Rome. This council adopted a dogmatic Decree or *Constitutio de Fide*, and a *Constitutio de Ecclesia*, the most important article of which latter declares the infallibility of the Pope when speaking *ex cathedrâ*.

COUNCIL BLUFFS, a city and county-seat of Pottawattamie co., Ia.; on the Missouri river, opposite Omaha, Neb., with which it is connected by bridges. The city is the E. terminus of the Union Pacific railroad and the converging point of all E. railroads which join the Union Pacific. It is situated at the foot of the bluffs, four miles from the river. The city is the farming trade center of southern Iowa. It contains several railway repair shops, stock yards, grain elevators, and other interests. The principal industries are carpentering, masonry, printing and publishing, plumbing and gas fitting, flour and grist milling, and brick and tile making. In 1919 there were 3 National banks, with $420,000 capital, and several private banking houses. The city is well lighted by gas and electricity, is connected with Omaha by electric railways, and has several fine parks. The most noteworthy buildings

are the County Court House, United States Government Building, High School, Masonic Temple, and Union Depot. There are many churches, a Library Association, Y. M. C. A., and the State Institution for Deaf Mutes. Council Bluffs derives its name from a council held on the bluffs between the Indians and the explorers, Lewis and Clarke. It was a Mormon settlement in 1846, and was chartered as a city in 1853. Pop. (1910) 29,292; (1920) 36,162.

COUNCIL OF WORKINGMEN AND SOLDIERS, more generally known by its Russian name, the Soviet, a word signifying "Council." A Council of Workingmen was first organized in Moscow, in 1905, by the Russian revolutionists, with Leon Trotzky as its chief executive. It participated to a leading extent in the revolutionary disorders which took place in Moscow at that time, but was dissolved with the suppression of the revolutionary movement by the Russian authorities. In March, 1917, a council of Workingmen's Delegates was again organized in Petrograd, this time not for the purpose of creating a revolution, but to meet revolutionary conditions created by the Premier, Protopopov.

The term "Soviet" has been universally associated with the Russian Bolsheviki, or Communists, but this is distinctly erroneous. The relation is closely parallel to the relation between the Constitution of the United States and the political party which happens to be in power. The Russian Government, or a number of its higher officials, desired to make a separate peace with Germany, in the early part of 1917. To create a pretext, they deliberately set about creating those abnormal economic conditions which they hoped would lead to disorders in the capital. Conscious of this move, the radicals and liberals were strongly opposed to any revolutionary activities at that time, wishing, as they did, to bring the war against Germany to a successful conclusion. Nevertheless, the autocracy continued in its irritative tactics. Realizing the inevitable crisis, and to prevent general disorder, the liberals, through the Duma, where they were in a majority, organized a Supreme Committee to take over the reins of government. The radical elements, and especially the labor organizations, feeling that they would not be fully represented by this body, at the same time took steps to form their Council of Workingmen's Delegates. This was actually accomplished in the night of March 11, 1917, when public disorder was already in full swing and the police had already begun firing on the assembled populace.

For months after these two bodies cooperated amicably in exercising the real power of the Provisional Government, both alike being in favor of maintaining order at home while the war was prosecuted against the enemy outside. A few weeks after the formation of the Council its name was changed to the Council of Workingmen's and Soldiers' Delegates, since the delegates from the military organizations at the front were allowed to participate in the deliberations of the body in increasing numbers.

During the early part of the régime of the Provisional Revolutionary Government the moderate Socialists were in control of the Council by a large majority, their representative, Alexander Kerensky, becoming Premier and War Minister. On Sept. 10, 1917, an effort was made to establish a military dictatorship by the Cossack commander-in-chief, General Kornilov, who sought to eliminate the Kerensky civil government. The effort failed, largely through the efforts of Kerensky, but the effect was to create a Bolshevist majority in the Soviet, the Bolsheviki, or extreme radicals, being in favor of terminating the dual character of the administration and establishing the Soviet in supreme authority. This swing to the extreme left continued with increasing strength, as delegates from the military organizations at the front arrived, and a month later the Bolshevist majority was able to overthrow the Provisional Government and establish what became generally known as the Soviet Government.

The Council, or Soviet, was intended by its founders to be something much more than a temporary measure for maintaining working-class organization during a critical revolutionary period. It embodies what they consider a radically new principle in government. Many of the Soviet organizers have stated that they were primarily inspired by the old town meeting system of our New England States, under which the people gathered periodically in meeting and directly initiated legislation. Based on this free democracy, the Soviet, however, instead of being based on geographical representation, insists on representation by occupation. Thus, in a large city the school teachers have a council of their own, quite separate and distinct from the council of the men engaged in building, or of the transportation workers. Thus, locally, the Soviets have a strong resemblance to trade unions. But in federation they lose this trade character, for the federa-

tions, which are formed on a geographical basis, consist of a union of all the soviets within their territories. Thus it is only locally that the Soviet has an educational aspect. It elects delegates to the regional federation, who represent their constituents as workers in a special trade or profession, rather than as citizens. Before the ascendancy of the Bolsheviki the Soviet was open to all citizens above voting age, including women, but after they came into power the Communists restricted suffrage to what they called the proletariat, persons living from the proceeds of their labor and not employing others as workers.

In 1920 the Soviet system of government was still in full power over the greater part of Russia. There has been much criticism of its efficiency by radical observers, themselves in favor of a Socialist system of government. So far removed is the local Soviet from the authority exercised by the National Executive Committee in Moscow, chosen by a quarterly All-Russian Congress of Soviets, that it exercises almost no control over its actions. This is said to be due to the many relays of delegates which are finally represented at the Congress. The local soviets send delegates to a regional soviet, which in turn sends delegates to a provincial soviet, where the delegates to the Congress are elected. By this time the popular character of the representatives is almost completely lost. See RUSSIA.

COUNSEL, in English law, a counselor-advocate in a trial; also the whole number of advocates engaged on any side collectively. King's Counsel are barristers appointed counsel to the Crown by the Lord Chancellor, and take precedence of other barristers. They have the privilege of wearing a silk gown, that of an ordinary barrister being of stuff. In the United States the word counsel is applied indiscriminately to all members of the legal profession retained in a cause; as, the counsel for the plaintiff, the counsel for the defendant.

COUNT, a title of nobility in most of the continental states of Europe, equivalent in rank to the British earl and the German *graf*. Under the first two races of the Frank kings, the title was given to officers of various degrees, and was at first attached to the office, and not the person; but in the progress of time, when feudalism had introduced inheritance instead of election as a fixed rule in succession, it became subject to the same law as the higher titles of kings and dukes, and conferred hereditary privileges on its possessor. The term **count** has in most of the states where it is in use degenerated into a mere title, to which no political importance is attached. Though the title has never been introduced into England, the wives of earls have from the earliest period of its history been designated as countesses.

COUNTERFEIT, to imitate, with the intention of deceit, the current medium of exchange or money of a country. In the United States, the crime of counterfeiting paper-money is punishable up to 15 years' hard labor, and a fine of $15,000; large coin, 10 years and $5,000 fine; minor coin, 5 years and $1,000 fine. Forging postal money orders, postal cards, government stamps of all kinds, and government securities, as also importing, possessing, or uttering false coins or notes with fraudulent intent are crimes punishable up to 10 years' hard labor. Mutilating and debasing the coin is also counterfeiting, but is not so severely punished as the making of counterfeit coins.

COUNTER-IRRITANT, an irritant application to the external parts of the body designed to diminish, counteract, or remove some other irritation or inflammation then existing. Such are rubefacients, perpetual blisters, issues of setons, cauterizing agents.

COUNTERPOINT, in music, a term equivalent to harmony or the writing of a carefully planned accompanying part; or that branch of the art which, a musical thought being given, teaches the development of it, by extension or embellishment, by transposition, repetition, or imitation throughout the different parts. Counterpoint is divided into simple, florid or figurate, and double. Simple counterpoint is a composition in two or more parts, the notes of each part being equal in value to those of each corresponding part or parts and concords. In florid counterpoint, two or more notes are writen against each note of the subject, or *canto-fermo*, and discords are admissible. Double counterpoint is an inversion of the parts, so that the base may become the subject, and the subject the base, etc., thus producing new melodies and new harmonies.

COUNTERSIGN, in military affairs, is a watch-word used to prevent unauthorized persons passing a line of sentries whose orders are to stop anyone unable to give it. It is fixed each day by the commanding officer, but may be changed at any moment, if necessary.

COUNTER-TENOR, the highest adult male voice, the same as alto.

COUNTY, a county or subdivision of a state for purposes of administration,

called in some states a parish or a shire; or, more specifically, the Roman name of what in Saxon times had been called a shire. In Saxon times, one created an earl received a shire to govern. When the Normans took possession of the land these Saxon earls were displaced by noblemen of similar rank who had come across with the Conqueror, and who from being his companions were called comites. These each ruled a shire (*comitatus*), and from the Latin designation *comitatus* the English word county ultimately came. In most of the United States the counties, to a great extent, preserve an autonomy, each being provided with its own sheriff, coroner, judiciary, and inferior legislative body (for purposes of local enactment), generally styled commissioners. Each county is charged with the support of its own paupers, with the maintenance of good roads, etc., and for local election purposes, usually constitutes an independent constituency.

COUPÉ (kö-pā'), a four-wheeled carriage carrying two inside, with a seat for the driver outside.

COUPON, a warrant or certificate for the periodical payment of interest on bonds issued for any term of years. The interest being payable in different cases quarterly, half-yearly, or yearly, as many coupons are attached to each bond as represent the total number of such payments as are to be made, with the date of payment printed on each.

COURBET, GUSTAVE (kör-bā'), a French painter; born in Ornans, Franche-Comté, June 10, 1819. In 1839 he was sent to study law in Paris, but turned toward art. In 1841 he took to landscape work, painting in the forest of Fontainebleau. In 1844 he began to exihibit at the Salon; and his works created a great sensation when shown in the Salon of 1850. His hunting scenes and animal subjects are especially vigorous and spirited. In 1869 he accepted the Cross of the Order of St. Michael from the King of Bavaria, and after the revolution of 1870 he was appointed Director of the Fine Arts. In the following year he joined the Commune, and was concerned in the destruction of the Vendôme Column (May 16), for which, in the following September, he was sentenced to six months' imprisonment, and to be fined for its restoration, his pictures being sold in 1877 toward that purpose. On his release he retired to Vevey, in Switzerland, where he died, Dec. 31, 1877.

COURLAND, or **KURLAND**, a former Russian government, and one of what, under the Empire, were called the Baltic provinces. It was formerly an independent duchy—properly, indeed, consisting of two duchies, Courland and Semgallen—and belonged, along with Livonia, to the Teutonic Knights. The difficulty of resisting the Russians led to the acknowledgment in 1561 of the feudal sovereignty of Poland. The country was long distracted by the contentions of two parties, one Russian and the other Polish; and was finally united to Russia in 1795. Biron was made Duke of Courland in 1737. It contains about 10,480 square miles; population about 812,000, mostly Protestants. It is generally a level country, with ranges of low hills, and contains many lakes, bogs, forests, and sand-dunes, but some parts have a very fertile soil. Cattle-breeding is on the increase; game abounds; and bears, boars, elks, and wolves are met with occasionally. The proprietors of land are mostly German; the peasantry, of Lettish extraction, are chiefly engaged in husbandry. There is little manufacturing industry. The capital is Mitau (pop. 47,000), the most flourising town is Libau (pop. about 90,000). In the World War (1914-1918) the Germans occupied it as a base for their attacks on Riga. In November, 1918, Courland, together with certain parts of the former Russian provinces of Livonia and Vitebsk, was formed into an independent state under the name of LATVIA (*q. v.*).

COURSING, the hunting of hares with greyhounds, which follow the game by sight, and not by scent. Coursing meetings are held in open parts of the country where hares are abundant, and the owners of greyhounds enter their respective dogs for various stakes. A judge is appointed, whose duty it is to decide with respect to the merits of the dogs engaged. The sport then begins by two dogs being selected for a course. The judge follows the greyhounds throughout the whole course, and awards the victory to the dog which shows the finest qualities of speed, endurance, and sagacity; and not necessarily to the dog which kills the hare. Coursing is of great antiquity, and is treated of by Arrian, who flourished A. D. 150. A pastime known as "Hare and Hounds," somewhat similar to coursing, was at one time quite popular in the United States. In this form one or more men, known as the Hares, were given a time handicap and provided with slips of paper which they dropped from time to time to show their trail. These runners were followed by others, known as Hounds, and the object was that the Hounds should overtake the Hares.

COURT, in law, a tribunal of justice; the hall, chamber, or place where justice

is administered, or the persons (judges) assembled for hearing and deciding causes, civil, criminal, military, naval, or ecclesiastical. Courts may be classified in various ways. A common distinction is into courts of record and not of record; the first being those the judicial proceedings of which are enrolled in records. They may also be divided into courts of original jurisdiction, inferior, and superior courts. In the United States the courts of law are either Federal or State. Federal courts derive their authority from the National Government. They comprise the Supreme Court of the United States, and the District Courts of the United States. The latter in 1911 assumed the work of Circuit Courts, abolished in that year. Other courts existing under the National Government are the United States Circuit Courts of Appeals, the United States Court of Claims, the United States Court of Custom Appeals, and various local tribunals for the District of Columbia.

The State courts derive their authority from the several State constitutions. They consist usually of a Supreme Court or Court of Appeals, and of local criminal and civil courts for the various counties. Speaking generally, Federal courts have jurisdiction in cases involving the laws of the United States; State courts have jurisdiction in cases involving State laws.

Courts in England derive their authority from royal or parliamentary enactment. They are designated, according to their jurisdiction, as "King's Bench Division," "Chancery Division," "Probate, Divorce, and Admiralty Division," "Court of Appeals," and the like. There are also the terms of court held by the Lord High Chancellor, the Lord Chief-Justice of England, the Master of the Rolls, the Lords of Appeal in Ordinary, and the various county courts. The highest legal tribunal in England is the House of Lords when sitting as a court of appeal.

In France the courts exist in accordance with the provisions of the code Napoleon. At their head is the Court of Cassation. In Germany there are federal courts and courts of the various German states. The Latin countries organize their courts to some extent upon the French model, except that in Spain, Portugal, and most South American countries the Roman Catholic priesthood have their own courts and cannot be held amenable to the ordinary tribunals.

COURT-MARTIAL, a court authorized by the articles of war, for the trial of all offenders in the army or navy, for military offenses. It has no jurisdiction over a citizen of the United States not employed in military service. It may consist of any number of commissioned officers, from 5 to 13. See MILITARY COURTS.

COURT-PLASTER (so-called because originally applied by ladies of the court as patches on the face), black, flesh-colored, or transparent silk varnished over with a solution of isinglass, which is often perfumed with benzoin, used for covering slight wounds.

COURTRAI (kör-trā'), a fortified town of Belgium, province of West Flanders, 26 miles S. of Bruges, on the Lys. Before the World War it was well built, having handsome and spacious streets, and a fine Grande Place, with several other squares. Its manufactures are table-linens, lace (which is celebrated), cambrics, cotton goods, etc., and it has extensive bleaching and dyeing works. Here, in 1302, took place the "battle of spurs" between the French and Flemings. During the WORLD WAR (*q. v.*) it was at various times the scene of important military operations. Pop. about 36,000.

COUSIN, VICTOR, a French philosopher; born in Paris, Nov. 28, 1792. He founded a school of eclectic philosophy; combining the doctrines of the Scotch school of Reid and Stewart, based on sensation, with those of Schelling and Hegel, which rest on the opposite principle of idealism or intuition. He possessed in a high degree the faculty of clear exposition, and for that reason his lectures and his writings enjoyed a great popularity. He rendered a memorable service both to philosophy and literature by his translation of "Plato," praised by Jowett. Besides his "History of Philosophy" and other works on that theme, he was author of a few biographical sketches. He died in Cannes, Jan. 2, 1867.

COUTTS, THOMAS, a Scotch banker; born in Edinburgh, Sept. 7, 1753; the son of a merchant and banker. With his brother James he founded the banking house of Coutts and Co. in London, and on the latter's death in 1778 became sole manager. Keen and exact in matters of business, although charitable and hospital in private, he left a fortune of some $4,500,000 at his death in London, Feb. 24, 1822. By his first wife, who had been a servant of his brother, he had three daughters, who married respectively the Earl of Guilford, the Marquis of Bute, and Sir Francis Burdett, Bart.; in 1815 he married Miss Mellon, the actress.

COVENANT, in law, an agreement between two or more parties in writing,

signed, sealed, and delivered, whereby they agree to do, or not to do, some specified act. In theology, the promises of God as revealed in the Scriptures, conditional on certain terms on the part of man, as obedience, repentance, faith, etc. In international politics an expression used to designate the terms on which agreements between nations are based. See LEAGUE OF NATIONS.

COVENANT, in Scotch history, the name given to a bond or oath drawn up by the Scottish reformers, and signed in 1557, and to the similar document or Confession of Faith drawn up in 1581, in which all the errors of Popery were explicitly abjured. The latter was subscribed by James VI. and his council, and all his subjects were required to attach their subscription to it. It was again subscribed in 1590 and 1596. The subscription was renewed in 1638, and the subscribers engaged by oath to maintain religion in the same state as it was in 1580, and to reject all innovations introduced since that time. The SOLEMN LEAGUE AND COVENANT was a solemn contract entered into between th General Assembly of the Church of Scotland and commissioners from the English Parliament in 1643, having for its object a uniformity of doctrine, worship, and discipline throughout Scotland, England, and Ireland, according to the word of God and the example of the best reformed churches. In 1662 it was abjured by act of Parliament, both in England and Scotland.

COVENANTERS, in Scottish history, the name given to the party which struggled for religious liberty from 1637 on to the revolution; but more especially applied to the insurgents who, after the passing of the act of 1662 denouncing the Solemn League and Covenant as a seditious oath (see above article), took up arms in defense of the Presbyterian form of Church government. The Presbyterian ministers who refused to acknowledge the bishops were ejected from their parishes and gathered around them crowds of their people on the hillsides, or any lonely spot, to attend their ministrations. These meetings, called "conventicles," were denounced as seditious, and to frequent them or to hold communication with those frequenting them was forbidden on pain of death. The unwarrantable severity with which the recusants were treated provoked them to take up arms in defense of their opinions. The first outbreaks took place in the hill country on the borders of Ayr and Lanark shires. Here at Drumclog, a farm near Loudon Hill, a conventicle was attacked by a body of dragoons under Graham of Claverhouse, but were successful in defeating their assailants (1679). The murder of Archbishop Sharp on Magus Moor, and this defeat, alarmed the government, who sent a large body of troops under the command of the Duke of Monmouth to put down the insurgents, who had increased in number rapidly. The two armies met at Bothwell Bridge, where the Covenanters were totally defeated (June 22, 1679).

In consequence of the rebellious protest called the SANQUHAR DECLARATION, put forth in 1680 by Cameron, Cargill, and others, as representing the more irreconcilable of the Covenanters (known as Cameronians), and a subsequent proclamation in 1684, the government proceeded to more severe measures. An oath was now required of all who would free themselves of suspicion of complicity with the Covenanters; and the dragoons who were sent out to hunt down the rebels were empowered to kill anyone who refused to take the oath. During this "killing time," as it was called, the sufferings of the Covenanters were extreme; but notwithstanding the great numbers who were put to death, their fanatic spirit seemed only to grow stronger. Even after the accession of William some of the extreme Covenanters refused to acknowledge him owing to his acceptance of Episcopacy in England, and formed the earliest dissenting sect in Scotland.

COVENT GARDEN, corrupted from CONVENT GARDEN, from having been originally the garden of the Abbot of Westminster, is a spacious square in London, celebrated for a great market held within it of fruit, vegetables, and flowers. The square was formed about 1631 from the designs of Inigo Jones. In the 17th century Covent Garden was a very fashionable quarter of the town. The market, now so famous, appears to have originated about 1656 in a few wooden sheds and stalls. It was long the property of the noble House of Bedford, but in 1913 the Duke of Bedford sold the property. London's most famous opera house, the Covent Garden Theater, is located there.

COVENTRY, a city in England, county of Warwick, 85 miles N. W. of London. It was formerly surrounded with lofty walls and had 12 gates, and was the see of a bishop early conjoined with Lichfield. Parliaments were convened here by the earlier monarchs of England, several of whom occasionally resided in the place. Pageants and processions were celebrated in old times with great magnificence, and a remnant

of these still exists in the processional show in honor of LADY GODIVA (*q. v.*). There are still a few narrow and irregular streets, lined with houses in the style of the 15th and 16th centuries. There are several fine churches. Coventry is the center of the ribbon trade. Pop. (1918) 119,023.

COVERDALE, MILES, the earliest translator of the Bible into English; was born in Yorkshire, England, in 1487. He was educated at Cambridge, and was ordained priest in 1514. He was led some years afterward to embrace the reformed doctrines, and, having gone abroad, assisted Tindall in his translation of the Bible. In 1535 his own translation of the Scriptures appeared, with a dedication to Henry VIII. Coverdale was almoner to Queen Catharine Parr, and officiated at her funeral. In 1551, during the reign of Edward VI., he was appointed Bishop of Exeter, but was ejected on the accession of Mary, and thrown into prison. After two years' confinement he was liberated, and proceeded first to Denmark, and subsequently to Geneva, where he was employed in preparing the Geneva translation of the Scriptures. On the accession of Elizabeth he returned to England, and held for a short time the rectory of St. Magnus, London Bridge. He died in London, in 1568.

COVINGTON, a city and county-seat of Kenton co., Ky.; on the Ohio river, opposite Cincinnati, which which it is connected by a handsome suspension bridge, 2,250 feet long, and costing $2,000,000. It is on the Louisville and Nashville and the Chesapeake and Ohio railroads. Electric lines connect it with near-by towns. It is a residence town for Cincinnati business men and is the see of a Catholic bishop. Covington is the farming and live-stock producing and trade center of central Kentucky, and has steamer connections with all river ports. The principal manufactories are cotton and woolen mills, rolling mills, tobacco factories, etc. Previous to the enactment of prohibition there were many distilleries. In 1919 there were 3 National banks, with $1,150,000 capital, and several daily and weekly newspapers. Covington is built on a beautiful plain, and has an area of over 5 square miles. The most notable buildings are the combined City Hall and Court House; the United States Government building, including the Postoffice and Federal Court rooms; the Public Library, the Roman Catholic Cathedral, and the Hospital of St. Elizabeth. Covington was settled in 1812; laid out in 1815, and incorporated as a city in 1834. Pop. (1910) 53,270; (1920) 57,121.

COW, the female of the bovine species called the ox (*Bos taurus*), of which the bull is the male. Like other domestic animals it has run into numerous varieties, and its primitive uniformity has given rise to manifold diversity. Nor is it in color alone that it has alterated. It has done so in form, besides which there are horned and hornless oxen. The Darwinian principle of natural selection with the survival of the fittest has adapted cattle of different sizes and qualities to different parts of the country; little, active cattle, thriving on the scanty herbage found high up the mountainside, and large, heavy, slow-going cattle of luxurious proclivities falling off unless they are allowed to revel amid the rank vegetation of river sides and meadows. The latter furnish the greatest quantity of milk. See DAIRY.

COWBANE, or **WATER-HEMLOCK** (*Cicūta virōsa*), a perennial, umbelliferous, aquatic plant, producing an erect, hollow, much-branched, striated stem three or four feet high, furnished with dissected leaves. It is highly poisonous.

COW-BERRY, the red whortleberry, a procumbent shrub of high moorlands in Europe, Asia, and North America, has evergreen, box-like leaves, and produces a red acid berry used for jellies and preserves.

COWBOYS, in the American Revolution, a band of American Tories who infested the neutral ground of Westchester county, N. Y., robbed the Whigs and Loyalists, and made a specialty of stealing cattle. A similar band of marauders on the British side received the name of "Skinners." The word cowboys is now used to designate the men who have charge of the cattle on the vast ranges in the W. and S. W. of the United States. Many of them were enlisted in two regiments of cavalry for the war with Spain, and, under the popular name of "Rough Riders," greatly distinguished themselves in the early part of the campaign against Santiago, in Cuba.

COWDRAY, WEETMAN DICKINSON PEARSON, Viscount, a British capitalist, born in 1856. He contested Colchester for Parliament in 1892, and was elected for that city as a liberal in 1895, representing it till 1910. He was made a baronet in 1894, baron in 1910, and viscount in 1916. He was largely instrumental in building up the oil interests of S. Pearson and Son, Ltd., of which he was president. During the war he was President of the Air Board.

He was High Steward of Colchester, and in 1918 was elected Rector of the University of Aberdeen.

COWES (kōwz), a British seaport on the N. coast of the Isle of Wight. It is built on both sides of the river Medina, dividing it into two towns, East and West Cowes. The town has an excellent harbor, is much frequented for watering ships, and is the headquarters of the Royal Yacht Club, and, moreover, a place of very fashionable resort, not only in the season, but for the greater part of the year. The famous Cowes Regatta is held there annually in August. Pop. about 15,000.

COW-ITCH, COW-AGE, or COW-HAGE, the stinging hairs of the plant described below, or any species akin to it, as *Mucuna urens*, *M. monosperma*, etc. They are used as a mechanical anthelmintic. The plant, *Mucuna pruriens*, is a twining annual, with pendulous racemes of dark-colored flowers, which appear in India in the rainy season. The legume, which is shaped like the letter S, is clothed with stinging hairs. These are easily detached and stick on the skin, producing intolerable itching. The legume, when young, can be boiled and eaten like kidney-beans. The name is sometimes (improperly) given by the negroes of the Southern States to the poison-ivy, *Rhus toxicodendron*.

COWLES, WILLIAM SHEFFIELD, an American rear-admiral, born in Farmington, Conn., in 1846. He graduated from the United States Naval Academy in 1867, and rising through the various grades, became lieutenant-commander in 1892, commander in 1899, captain in 1902, and rear-admiral in 1908. Besides seeing service in all the principal stations, he acted as naval attaché at London, and as naval aide to the Secretary of the Navy. He was chief of the Bureau of Equipment, and a member of the Board of Construction in 1906. In 1908 he retired from active service. He was a member of the Connecticut House of Representatives in 1916, and during the World War served as an officer of the Home Guard of Connecticut.

COWLEY, ABRAHAM, an English poet and essayist; born in London in 1618. Well educated and high in royal favor, he was a fashionable and fortunate poet till the Civil War made havoc of royal favorites. His volumes, "The Mistress," "Poems," various Vergilian elegies and anacreontic love songs, and his essays, were set in the first rank by contemporaries. The first collection of his works, in one volume, appeared in 1668. He died in Chertsey, Surrey, July 28, 1667.

COW PARSNIP (so called because the plant is good fodder for cows), *Heracleum sphondylium*, or any other species of the genus.

COW PEA (*Trifolium medium*), called also cow-grass, etc., but is neither a pea nor a grass; it is a trefoil or clover.

COWPER, WILLIAM, an English poet; born in Berkhampstead, Nov. 15, 1731; was the great-nephew of the Lord-Chancellor Cowper. After completing his education, his family procured him the place of clerk to the House of Lords, but his nervousness and constitutional timidity were such that he was obliged to resign it. He now fell into so terrible a state of nervous debility that he was for some time placed in the lunatic asylum of Dr. Cotton. The skill and humanity of that gentleman restored him, and he retired to Huntingdon. Here he became acquainted with the family of the Unwins; and after Mr. Unwin's death he removed with Mrs. Unwin to Olney, Buckinghamshire. His natural melancholy colored his religious views and feelings, and he fell often into the most painful despondency, but continued to write. In addition to translating Homer, he wrote "The Task," the best of all of his poems; "Tirocinium"; a host of smaller works; and his correspondence exhibits him as one of the most elegant of English letter-writers. He died in Norfolk, April 25, 1800.

COW PLANT, a perennial asclepiad of Ceylon, which acquired a factitious celebrity from the oft-repeated statement that its milky juice is used as milk, and that its leaves are boiled to supply the want of cream.

COWRY, the English name of the molluscous genus *Cypræa*. The money-cowry is *C. moneta*, a native of the Pacific and Eastern seas. Many tons are annually shipped to Great Britain, whence they are again taken as money to be used in commercial transactions with the tribes of western Africa. There is another species, *C. annulus*, used locally among the Eastern islands for the same purpose.

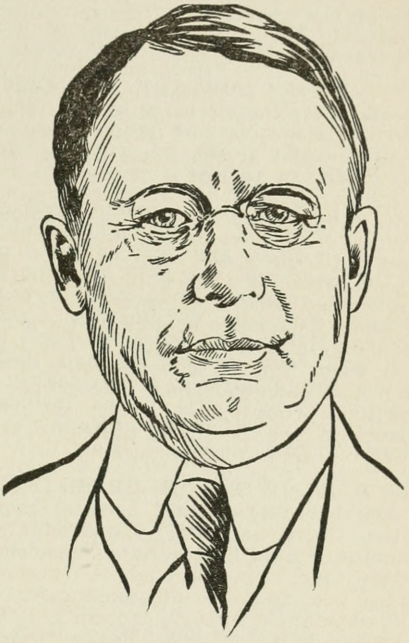
COWSLIP, a well-known plant, *Primula veris*, of the same genus as the primrose, *P. vulgaris*, the oxslip, *P. elatior*, etc. The two last are very much akin. The first and second widely differ in appearance, but statements from time to time appear that they have been found growing from the same root, in which case they would not be two species, but varieties of one. The cowslip has ovate-crenate, toothed, and wrinkled leaves, with the flowers in an umbellate scape.

The flowers are sedative and diaphoretic. They make a pleasant soporific wine.

COX, ISAAC JOSLIN, an American educator, born in West Creck, Ocean co., N. J., in 1873. He graduated from Dartmouth College, engaged in research work in Mexico for several years and took post-graduate studies at the University of Texas and the University of Chicago. After serving on the faculties of several colleges and universities he became professor of history of Northwestern University in 1919. He was a member of many historical societies and the author of "The Journeys of La Salle and His Companions" (1905); "The Early Exploration of Louisiana" (1906); "The West Florida Controversy, 1798-1813" (1918). He contributed historical articles to several encyclopædias, and in 1919 was a member of the Doheny Research Foundation in Mexico.

COX, JACOB DOLSON, an American soldier; born in Montreal, Oct. 27, 1828; was graduated at Oberlin in 1851, becoming a lawyer; but upon the outbreak of the Civil War was made Brigadier-General of Ohio Volunteers. In 1862 he became Major-General of United States Volunteers, and in 1864 commanded a division at Nashville. He was elected governor of Ohio in 1865, and in 1869 became Secretary of the Interior in President Grant's cabinet. He died in Magnolia, Mass., Aug. 4, 1900.

COX, JAMES MIDDLETON, an American public official, born in Jacksonburg, O., in 1870. He was the son of Gilbert and Eliza A. Cox. His father was a farmer and his early days were spent at Jacksonburg on his father's farm. His first schooling was obtained in the country schools of the neighborhood, but he later removed to Middletown, where he again attended the village school. For several years he taught school and at the same time wrote for the local newspapers. Removing to Cincinnati, he became a reporter on the staff of the "Inquirer," and during this service he made the acquaintance of Paul J. Sorg, a wealthy tobacco manufacturer, and when the latter was elected to Congress, Cox became his private secretary. Following the conclusion of this service, he purchased the Dayton "News" of Dayton, O., and, with Mr. Sorg's help, built it up until it was a very profitable enterprise. Five years later he purchased the Springfield, O., "Press Republic." These two papers formed the news league of Ohio. In 1908 he was elected to Congress, and on the expiration of his term, was re-elected. He served on the Committee of Appropriations and gained the conviction of the necessity of a budget system for the State and Nation. During his second term in Congress, he was nominated for governor of Ohio, and, after an aggressive campaign, was elected. At the same time there was adopted a new State constitution and in connection with the application of this instrument, Governor Cox inaugurated many reforms of his own, including a model rural school measure, and reforms relating to taxation and financial reform. At the expiration of his first term, he



JAMES M. COX

retired from public office, having been defeated, but he was re-elected again in 1916 and again in 1918. His administration of the office of governor was notable. In addition to the measures noted above, he put into effect the Workmen's Compensation Law, Mothers' Pension Law, Child Labor Law, and the Budget Law. His administration attracted wide attention and he became one of the strongest candidates for the Democratic nomination for the presidency in 1920. He was nominated on the 44th ballot at the convention at San Francisco, on July 6th. Following his nomination he at once began an aggressive campaign of speech-making throughout the country, and, from this time until Nov. 2, visited nearly every State in the Union. He was defeated by Senator Harding, the Republican candidate, and at once resumed his

duties as governor of Ohio, serving until March 4, 1921. See UNITED STATES, HISTORY.

COX, KENYON, an American painter; born in Warren, O., Oct. 27, 1856. He studied in Paris under Duran and Gerome, settling in New York in 1883 as a portrait and figure artist. He was a member of the Society of American Artists. He was especially noted for his mural paintings. Notable examples are "Art and Science," Congressional Library; "Progress of Civilization," State House, Des Moines, Ia.; "Beneficence of Law," County Court House, Newark, N. J., etc. Among his pictures may be mentioned "Hope and Memory," Cox collection, Cleveland, O.; "Harp Player," Metropolitan Museum, New York. His portrait of St. Gaudens received a medal at the Paris Salon. He died on March 17, 1919.

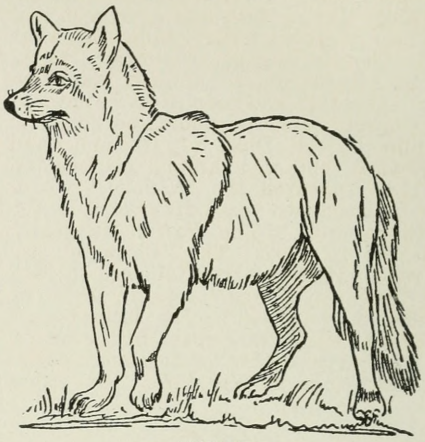
COX, PALMER, a Canadian author and illustrator. He was born at Granby, Quebec, in 1840, and was educated at Granby Academy. In 1863 he went to California, engaging in railroading, contracting, etc., and writing for newspapers. He arrived in New York in 1875, and took up writing and illustrating for children's magazines and humorous books. His works include: "Squibs of California," "Hans Von Pelter's Trip to Gotham," "How Columbus Found America," "That Stanley," "The Brownies, Their Book," "Brownies at Home"; "Brownies," a spectacular play in three acts; "The Brownies in Fairyland," a musical cantata; "Brownie Primer," etc.

COX, SAMUEL SULLIVAN, an American statesman and author; born in Zanesville, O., Sept. 30, 1824. He served some terms in Congress, and became minister to Turkey. His works are: "Eight Years in Congress," "Why We Laugh," "Diversions of a Diplomat in Turkey," "A Buckeye Abroad," "Arctic Sunbeams," "Orient Sunbeams," "Free Land and Free Trade," and others. He died in New York, Sept. 10, 1889.

COYOTE (koi-ōt'), the American wild dog or prairie-wolf, *Canis ochropus* or *Lyciscus latrans*. The Coyote is virtually a wild dog and breeds with the domestic dog, and dogs will often refuse to injure the female coyote. In general appearance the coyote resembles the typical wolf, the fur being a dull yellowish gray, with dark, even black, clouded spots.

COZUMEL, an island in the Caribbean Sea, off the coast of Yucatan.

CRAB, a popular name for all the 10-footed, short-tailed crustaceans constituting the sub-order *Brachyura*, order *Decapoda*, comprising many genera, distinguished from the lobster and other macrurous or long-tailed decapods by the shortness of their tail, which is folded under the body. The mouth has several



COYOTE

pairs of strong jaws, in addition to which the stomach has its internal surface studded with hard projections for the purpose of grinding the food. The stomach is popularly called the "sandbag"; a little behind it is the heart, which propels a colorless lymph (the blood) to the gills ("dead man's fingers"). The liver is the soft, rich yellow substance, usually called the fat of the crab. They "moult" or throw off their calcareous covering periodically.

The first pair of limbs are not used for locomotion, but are furnished with strong claws or pincers. Their eyes are compound, with hexagonal facets, and are pedunculated, elongated, and movable. Like most individuals of the class, they easily lose their claws, which are as readily renewed. The racer-crabs of the West Indies suck the juice of the sugar-cane. Most inhabit the sea, others fresh water, some the land, only going to the sea to spawn. The common large edible crab (*Cancer pagurus*) is much sought after.

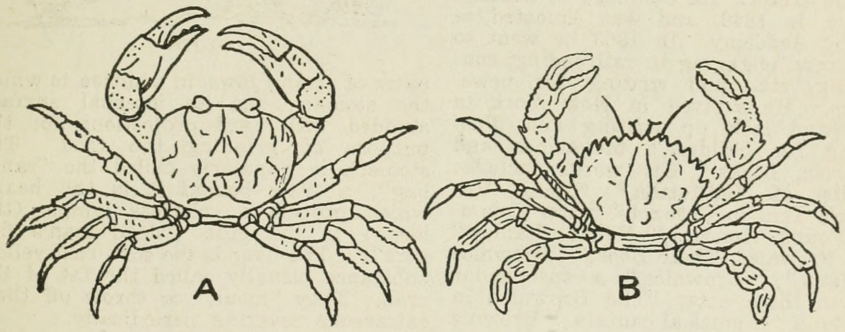
CRAB, a name given to various machines, especially to a kind of portable windlass or machine for raising weights. Crabs are much used in building operations for raising stones and many other weights, and in loading and discharging vessels.

CRAB APPLE, a small, wild, very sour species of apple, from which a fine jelly is made.

CRABB, GEORGE, an English lawyer and writer; born in Palgrave, Suffolk,

Dec. 8, 1778; best known as the author of a "Dictionary of English Synonyms," published in 1816. He died near London, Dec. 4, 1851.

CRABBE, GEORGE (krăb), an English poet; born at Aldborough, Suffolk, in 1754. Having failed as a surgeon and apothecary in his native village he went to London to engage in literary work. Burke helped him to publish his poem "The Library," and soon after he entered the Church. He was appointed domestic chaplin to the Duke of Rutland, and afterward obtained ample preferment. In 1783 appeared the "Village," which was followed two years afterward by the "Newspaper." "The Parish Register" appeared in 1807. The "Borough" appeared in 1810 and was followed in 1812 by "Tales in Verse," and in 1819 by "Tales of the Hall." The latter years of Crabbe's life were spent in the peaceful discharge of his professional duties at Trowbridge in Wiltshire. His poems are all characterized by homely truthfulness, simplicity, and pathos. He died in Trowbridge, Wilts, in 1832.



CRAB
A. Common Crab. B. Blue Crab.

CRAB SPIDER or **MATOUTOU**, a spider that belongs to the typical genus of the family *Mygalidæ*, which may be at once known by the shape of its mandibles and the terrific claws which proceed from them. In the greater number of spiders the claws are set horizontally, but in the *Mygalidæ* they are bent downward, and strike the prey much as a lion clutches at his victim with his curved talons. The great crab spider preys on young birds and other small vertebrates.

CRACOW, the old capital of Poland; in 1815-1846 capital of a republic of the same name later forming part of Austrian Galicia; is on the left bank of the Vistula, where it becomes navigable, and consists of Cracow proper, or the old city, and several suburbs. It is the see of a bishop, is well built and regularly fortified. The cathedral, a fine old Gothic edifice, contains monuments of many Polish kings, of Kosciusko, etc. The university was founded in 1364, but gradually fell into decay, and was reorganized in 1817. It has a library of 300,000 volumes. Three miles from the city is a hill 65 feet high thrown up in 1820-1823 in honor of Kosciusko. In November, 1914, the Russians reached the outer line of forts, but were repulsed by Austrian forces. The region around the city was the scene for concentrating German-Austrian armies for Mackensen's drive, which resulted in the reconquest of nearly all of Galicia. As a result of the World War Cracow became a part of the new republic of POLAND (*q. v.*). Pop. about 180,000.

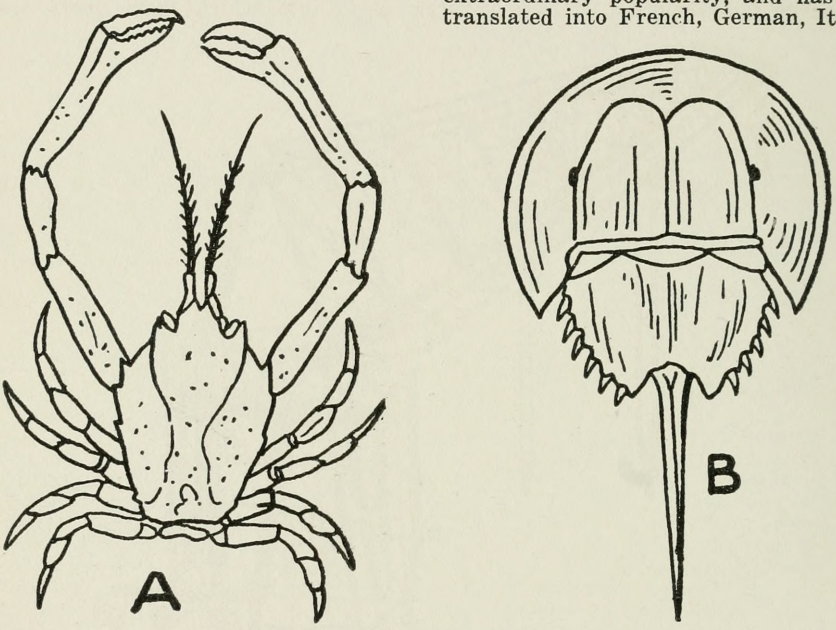
CRADLE, or "rocker," a mechanical contrivance used in placer mining, consisting of a box on rockers and moved by hand, used for washing out the gold-bearing soil.

CRADLE OF LIBERTY, a name by which Faneuil Hall, in Boston, is known. During the Revolution it was the favorite meeting place of the Americans. The name is also sometimes applied to the city of Boston.

CRAFTS, WILBUR FISK, an American clergyman and publicist, born in Fryeburg, Me., in 1850. He graduated from Wesleyan University in 1869 and was ordained a Methodist clergyman in 1867. In 1880 he joined the Congregational Church, and in 1883 the Presbyterian, serving in pastorates in several churches in New England, Chicago, Brooklyn, and New York. Always having been active in Sunday School work, he founded, in 1889, the American Sabbath Union. He lectured throughout the United States as field secretary of this organization, and in 1895 founded and was superintendent of the International Reform Bureau. He made many journeys

to Europe and to the Orient, lecturing on religious subjects. His writings include "The Ideal Sunday School" (1876), "Successful Men of To-day" (1883), "Practical Christian Sociology" (1895), "Patriotic Studies" (1906), "Prohibition Handbook" (1911), and "Bible Stories and Poems" (1914). He served as a member on many commissions on prohibition and other social subjects, and was a member of many commissions on war-time activities during the World War.

CRAIK, DINAH MARIA MULOCK, an English author; born in Stoke-upon-Trent in 1826. She early took the burden of supporting an ailing mother and two younger brothers and wrote stories. Her first serious appearance as a novelist was in 1849, with her story, "The Ogilvies," which was followed by "Olive," "The Head of the Family," and "Agatha's Husband." She never surpassed, however, or even equaled her domestic novel, "John Halifax" (1857), which had an extraordinary popularity, and has been translated into French, German, Italian,



CRAB
A. Masked Crab. B. King Crab.

CRAIG, (EDWARD) GORDON, an English theatrical manager. He was born in 1872 and acted for the first time in 1889 in London, at the Lyceum Theater, under the direction of Henry Irving. He was active as an actor for eight years and in 1897 commenced the study of the art of the theater. He made many productions in Great Britain and on the Continent, in which he introduced features which were the results of his study. He founded a school for the art of the theater, Arena Goldoni, Florence, in 1913, and was a member of the Society of Twelve. His works include: "The Art of the Theater," essays in "The Mask," and in "The Marionette," "Portfolio of Etchings," "The Page," "On the Art of the Theater," "Towards a New Theater."

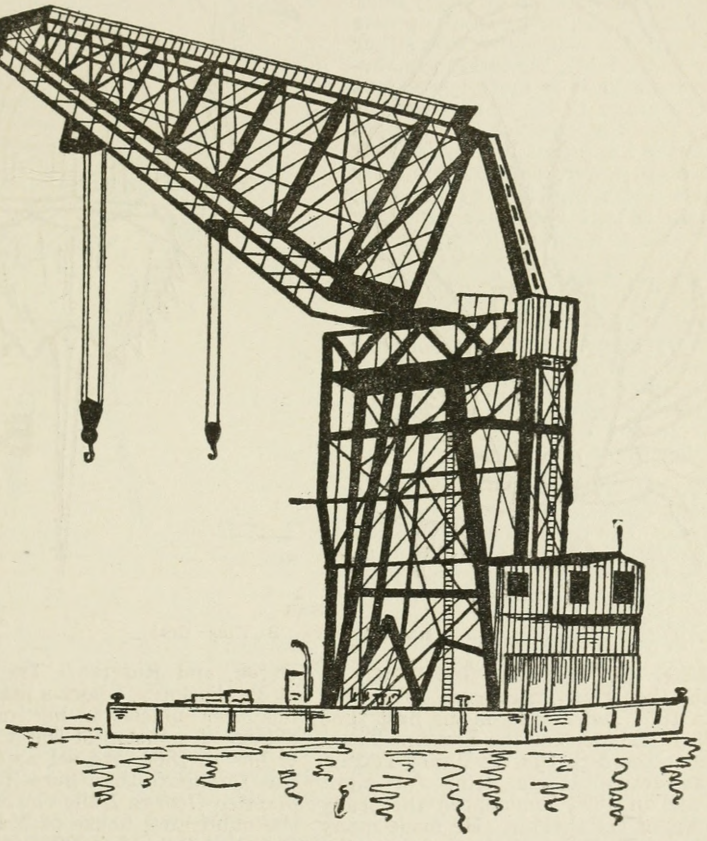
CRAIGIE, PEARL RICHARDS. See HOBBES, JOHN OLIVER.

Greek, and Russian. The scene is laid at Tewkesbury, where a marble medallion has been placed to her memory in the abbey. A pension of £60 a year, awarded to her in 1864, she set aside for authors less fortunate than herself. In 1865 she married George Lillie Craik, a partner in the publishing house of Macmillan & Co. She died Oct. 12, 1887.

CRAIOVA, or **KRAJOVA,** the chief city of the province of Doljiu, Rumania, situated on the river Jiu, 110 miles W. of Bucharest, with a population before the World War of about 45,000. The town is the center of an important grain district on the edge of the Wallachian Plain. It was the first important capture made by the Germans on the Rumanian northern front, after the Teutons had broken through the Carpathian Mountains in November, 1916, and began their

invasion of Rumania, the town falling into their hands on Nov. 21, 1916, and giving them control of the Craiova-Orsova railroad line. The final defeat of the Central Empires brought the town once more into the hands of the Rumanians.

CRAM, RALPH ADAMS, an American architect. He was born in 1863 at Hampton Falls, N. H., and began working as an architect when he was 26 years old, becoming a member of the firm of Cram, Goodhue and Ferguson. His early work was varied, but was gradually concentrated on ecclesiastical and educational buildings. Among his important undertakings were the Graduate College and Cleveland Tower, Princeton University; Rice Institute, Tex., and Richmond and Sweet Briar Colleges, Va. These were followed by Williams College and Phillips Exeter Academy; St. Albans Cathedral, Toronto; St. Paul's Cathedral, Detroit; St. Thomas' Church, New York; Calvary Church, Pittsburgh, Pa., and others. He was chosen also as consulting architect for the Cathedral of St. John the Divine, New York, and has written on architectural subjects, titles of his works being: "Church Building," "The Ruined Abbeys of Great Britain," "Impressions of Japanese Architecture and the Allied Arts," "The Gothic Quest."



A FLOATING CRANE

CRAMP, an irregular spasmodic contraction of the muscles of the whole or different parts of the body, causing most severe pain by the knotty and hardened state into which their fibers are contracted. Though it may involve the greater number of the muscles at once, the parts most generally affected are those of the feet, legs, thighs, abdomen, and arms. In general, it is readily removed by the forcible exertion of the antagonist muscles by friction and warmth.

CRANBERRY, a plant, *vaccinium oxycoccos*, having also the book-name of the marsh whortleberry. It has a fili-

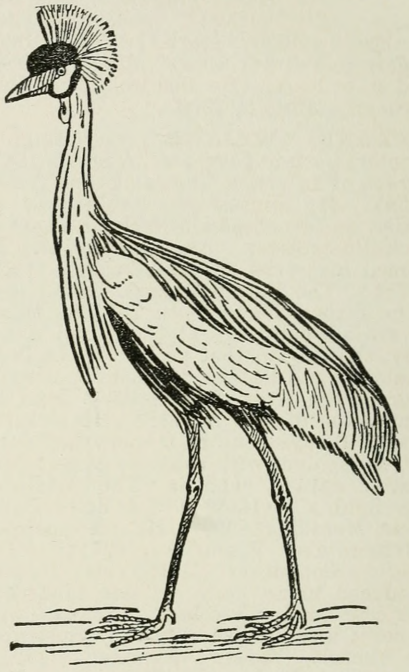
form stem, ovate evergreen leaves; a terminal single-flowered peduncle, a four-parted revolute corolla, and a berry of a bright roseate hue. It is found in bogs. The berries are used for preserves and pies.

CRANE, a machine for lifting weights, worked either by hand, or by steam, or by hydraulic power. The most common hand form consisting of an upright revolving post and a projecting arm (usually at an angle of about 45°), the jib with a fixed pulley at its extremity.

Whenever much hoisting or heavy work has to be done, steam or hydraulic power is always used; the cranes are then either stationary or portable, the latter type being used whenever it is more convenient to move the crane to its work than the converse. The stationary power cranes differ from the hand ones mainly in their vastly greater power, and consequently greater size and complexity of gearing; where steam is used there are generally two direct-acting steam-cylinders, which replace the two handles worked by hand. The very powerful stationary cranes used in docks capable of lifting 50 to 75 tons are examples of this kind. Hydraulic power is very largely used in cranes for these places and in great steel-works; they are simpler in construction, a good deal of gearing being done away with; the water in the operating cylinder is always under great pressure.

CRANE, any bird of the genus *Grus*, or the family *Gruidæ*. The common crane is *G. cinerea*. The tip of the bill is horn-colored, its middle part greenish-black, the base reddish. The top of the head, which is naked, is of a red color; the plumage in general is an ashy-gray; the throat, neck, and occiput darker; the feet black—length, 3 feet 8 inches to 3 feet 10 inches. It is a grallatorial bird, frequenting marshes. It is a migratory bird, in winter living in India, Egypt, and other warm countries of the Old World, and in summer migrating to the N. In these passages it flies, generally by night, high in air, in a large wedge-formed flock, led by a single leader, or in long lines, and with discordant cries. Where it breeds, which is in the N. of Europe and Siberia, the nest is among rushes. The eggs, two in number, are pale bluish-green, with brown markings.

CRANE, ROBERT BRUCE, an American painter. He was born in New York in 1857, receiving his first lessons under Alexander Wyant, and later studying in Europe. He devoted his talent in the main to the portrayal of landscapes, such subjects as plowed fields and meadows covered with snow attracting him. Interesting examples of his work are "Autumn" (National Gallery, Washington); "Autumn Uplands" (Metropolitan, New York); "March" (Brooklyn Museum), "Springtime" (Peabody Institute, Baltimore); "The Hills," which won the Saltus prize (National Academy). He was a member of the National Academy of Design and American Water Color Society.



THE CROWNED CRANE

CRANE, CHARLES RICHARD, an American manufacturer and diplomat, born in Chicago in 1858. He was educated in the Chicago public schools, entered the employ of the Crane Company, and became 1st vice-president in 1894 and president in 1912. In 1909 he was appointed minister to China, but resigned before assuming his official duties. He was again appointed minister to China by President Wilson in 1920. In 1917 he was a member of the Diplomatic Commission to Russia, and was American commissioner on mandates in Turkey in 1919.

CRANE, FRANK, an American clergyman and writer. He was born in 1861 in Urbana, Ill., was educated at Illinois Wesleyan University and ordained to the Methodist Episcopal ministry in 1882. A preacher in Methodist churches in Chicago from 1896, he joined the Congregationalists in 1903. After

being pastor of the Union Congregational Church of Worcester, Mass., for five years, ending in 1909, he took up writing moral essays for syndicated newspapers. His works include: "The Religion of To-morrow," "Lame and Lovely."

CRANE, STEPHEN, an American story-writer; born in Newark, N. J., Nov. 1, 1870. He wrote "Maggie," "The Red Badge of Courage," and "George's Mother" (1898), stories; "The Black Riders and Other Lines" (1895), verse; and other books. He died in Badenweiler, Germany, June 5, 1900.

CRANE, WALTER, an English painter; born in Liverpool, Aug. 15, 1845; the son of an artist, Thomas Crane (1808-1859). He himself was trained as an artist, and much of his work consisted of book-illustrations. Among these may be named his series of "Toy-books" (1869-1875); "The Baby's Opera" (1877), and "The Sirens Three." In 1862 he began to exhibit paintings at the Royal Academy, showing in that year "The Lady of Shalott," and he was a constant contributor to the Grosvenor Gallery from its foundation in 1877 till 1888. His pictures nearly always deal, in a somewhat decorative fashion, with subjects of an imaginative nature, such as "The Riddle of the Sphinx" (1887); "La Belle Dame Sans Merci" (1895). He also painted "Britannia's Vision" (1897); "The World's Conqueror" (1898), etc. He also produced many very delicate landscape subjects in water-colors; designed wall papers; and published poems, illustrated by himself, "Queen's Summer" (1891), and "The Claims of Decorative Art" (1892). Since 1888 a member of the Royal Society of Painters in Water-colors, he was in 1893 appointed art director to the city of Manchester. He was a prominent socialist, and died in 1905.

CRANE, WILLIAM H., an American actor; born in Leicester, Mass., in 1845. He made his first appearance on the stage when 18 years old and soon won recognition as a comedian. His rôle in "The Henrietta," in which he was associated with Stuart Robson, was his first great success. Since 1889 he "starred" in "The Senator"; "The American Minister"; "Father and the Boys" (1907); "The Senator Keeps House" (1911); "The New Henrietta" (1914), etc.

CRANE, W(INTHROP) MURRAY, an American public official and manufacturer; born at Dalton, Mass., April 23, 1853. He was educated at the public schools, and at Williston Seminary (A.M., Williams 1897). He was Lieutenant-Governor of Massachusetts (1897-1899) and Governor (1900-1902). On the death of Senator Hoar he was nominated to fill the vacancy in the United States Senate, and was elected in January, 1905, for the term expiring in 1907, and re-elected for the term 1907-1913. He was a member of the Republican National Committee (1892-1902), and again from 1904 on, and a delegate-at-large to all Republican National Conventions since 1892, except in 1900. He died in 1920.

CRANE-FLY, singular, any two-winged fly of the genus *Tipula* or the family *Tipulidæ;* plural crane-flies, the genus *Tipula* or the family of *Tipulidæ;* the typical species is popularly known as Daddy Long-legs.

CRANGANORE, a town in Hindustan, in the presidency of Madras, state of Cochin, on the Malabar coast. Pop. about 10,000. It is the traditional field of St. Thomas' labors in India; Jews have been settled here since the 4th century; and it is certain the Syrian church was established before the 9th.

CRANK, in machinery, a lever or arm on a shaft, driven by hand (*e. g.*, a winch-handle), or by a connecting-rod, its object being to convert reciprocating motion into rotary motion. Engine-cranks which convert the to and fro motion of the piston into continuous rotation of crank-shaft are connected to the piston-rod end by the connecting-rod.

CRANMER, THOMAS, Archbishop of Canterbury; born in Aslacton, Nottinghamshire, July 2, 1489. The opinion which he gave on the question of Henry VIII.'s divorce from his first wife, Catharine of Arragon, recommended him to that monarch, who employed him to vindicate the measure, and sent him, in 1530, with other envoys, to maintain his view before the Pope. His mission was fruitless. On his way home, he visited Germany, and at Nürnberg married a niece of Osiander. After his return he was raised to the archbishopric of Canterbury, in which office he zealously promoted the cause of the Reformation. Through his means the Bible was translated and read in churches; and he greatly aided in suppressing the monastic institutions. A few weeks after his appointment, he pronounced, in a court held at Dunstable, the sentence of divorce of Catharine, and confirmed the king's marriage with Anne Boleyn. In 1536, when Anne Boleyn was destined to lose her reputation and her life, he meanly stooped to promote the sentence of divorce. This and other compliances with the monarch's will insured him the gratitude of Henry, who upheld him in all his contests with Bishop Gardiner and others who accused

him of heresy and faction. By Henry's will he was appointed one of the council of regency to Edward VI.; and as the young king was brought up chiefly under the archbishop's care, it enabled him to further the objects of the Reformation in a regular and consistent manner, by framing the liturgy, the homilies, articles of religion, etc. On the accession of Mary, he was committed to the Tower, along with Latimer and Ridley. In March, 1554, they were removed to Oxford, and confined there in common prison. Latimer and Ridley bore their cruel fate with courage; but the spirit and principles of Cranmer temporarily gave way under the severity of his sufferings. He was induced, in the hope of saving his life, to sign no fewer than seven recantations; but his enemies were determined on his death. On March 21, 1556, he suffered martyrdom, as his fellow-reformers had done, opposite Baliol College. His courage returned at the end, and he died repenting that he had changed his faith.

CRANNOG, a fortified lake dwelling, of which many are to be found in Ireland. They are supposed to have been formed about the 9th or 10th century.

CRANSTON, a city in Rhode Island, in Providence co. It is on the New York, New Haven and Hartford railroad, and the Providence river. Included within its limits are several villages. It is the site of a State reformatory for boys and girls, State prison, almshouse, insane asylum, and a workhouse. The industries include cotton mills, dairying, print goods manufacture and a wire factory. Pop. (1910) 21,107; (1920) 29,407.

CRANSTON, EARL, an American bishop of the Methodist Episcopal Church. Born in Athens, O., in 1840, and graduated from Ohio University in 1861, he served as a cavalryman in the Union armies during the Civil War. When the war closed he entered the Ohio Conference of the Methodist Church. At the General Conference of 1884 he was elected publishing agent, a position he held until his election to the episcopate in 1896. From 1898-1900 he visited the churches in China, Japan, and Corea. He was placed on the retired list by the General Conference of 1912.

CRASHAW, RICHARD, an English poet; born in London in 1613. A convert to Catholicism, he wrote "Steps to the Temple" and "Sacred Poems," productions of great imaginative power. In 1634 Crashaw published a volume of Latin poems, "Epigrammatum Sacrorum Liber" (2d ed., 1670), in which appeared the famous line on the miracle at Cana:

"Lympha pudica Deum vidit et erubuit"
(The modest water saw its God and blushed.)

He died in Rome or Loreto, May or June, 1649.

CRASSULACEÆ, house-leeks; an order of *hypogynous exogens*, alliance *violales*. It consists of succulent herbs or shrubs with entire or pinnatifid leaves and no stipules, flowers usually in sessile, often unilateral cymes.

CRASSUS, LUCIUS LICINIUS, a Roman orator, 140 B. C., who is introduced by Cicero, in the treatise "De Oratore," as the representative of that writer's own opinions on the subject of oratory. He was unfortunate as a legislator, inasmuch as the law proposed by him, to compel all who were not citizens to depart from Rome, was a main cause of the Social War. He was distinguished for his love of the arts; and his mansion upon the Palatine is cited as having been one of the most noteworthy in ancient Rome. He died 91 B. C.

CRASSUS, MARCUS LICINIUS, a Roman consul and triumvir; immensely rich and passionately fond of money; took part with Sulla in the civil war. As prætor, in 74 B. C., he was sent against the insurgent gladiators under Spartacus, and totally defeated them near Rhegium. The next year he was consul with Pompey. Pompey and Crassus were, however, personal enemies, and it needed the powerful influence of Cæsar to effect a formal reconciliation between them, which took place in 60 B. C., the first triumvirate being then formed. Consul again five years later, Crassus had Syria for his province, and made war on the Parthians. He was defeated by them with immense slaughter, and was put to death, 53 B. C. It is said that Orodes, King of Parthia, had melted gold poured into the dead mouth, with the taunt, "Sate thyself now with that metal, of which in life thou wert so greedy."

CRATÆGUS, a genus of trees, order *Pomaceæ*. Calyx segments short and acute, petals large and roundish, styles 1 to 5, fruit oval or round, concealing the upper end of the cells, which are long. It differs from the genus *Pyrus* in containing a variable number of stones, and from the medlar by having the fruit closed. The genus contains about 80 well marked species and varieties, occurring in the temperate parts of both hemispheres. *C. oxyacantha* is the hawthorn, or may. It is a European thorn. The Oriental species have heavy leaves, large, fragrant flowers, and large, succulent, somewhat angular fruit; those of America are often very spinous. Finally, some

species of the genus—viz., *C. mexicana* and *C. pyracantha*—are evergreens.

CRATER (a cup), the central cup-shaped cavity in the summit of a volcano through which the lava, stones, scoria, etc., are for the most part ejected.

CRATER (the bowl, or goblet), a constellation S. of the equator and N. of Hydra, one of Ptolemy's original 48. Its brightest star is only a little above the fourth magnitude. The constellation lies between Leo, Virgo, Corvus, Hydra, and Sextans.

CRATER LAKE, a small lake in the Cascade Mountains, in Oregon, remarkable for its wall of perpendicular rock, from 1,000 to 2,000 feet high.

CRAWFISH, or **CRAYFISH**, a name of various crustaceous animals, the common crawfish being the river lobster, a macrurous (long-tailed), 10-footed crustacean, resembling the lobster in appearance and habits. It inhabits the fresh waters of Europe and the N. of Asia, and is common in some of the streams of England. In the United States crawfish of the genus *Astacus* and *Cambărus* occur.

CRAWFORD, COE ISAAC, an American public official; born at Volney, Ia., Jan. 14, 1858. He was graduated from the University of Iowa, admitted to the bar, and began the practice of law at Independence, Ia., in 1883, removing in 1884 to Dakota Territory. In 1886 he was appointed Attorney of Hughes county, and in 1889 became a member of the Territorial Legislative Council. He was elected Governor of South Dakota by the Republicans in 1907, and served as United States Senator from 1909-1915.

CRAWFORD, FRANCIS MARION, an American novelist; born in Tuscany, Italy, Aug. 2, 1853; son of THOMAS CRAWFORD (*q. v.*). He was educated at Concord, N. H.; Trinity College, Cambridge; Karlsruhe, and Heidelberg. At Rome he devoted himself to the study of Sanskrit, and during 1879-1880 was engaged in press work at Allahabad, where he was admitted to the Catholic Church. He was selected by the government committee to write the National Ode at the centennial of the American Constitution, Sept. 17, 1887. His first novel, "Mr. Isaacs" (1882), was a book of striking and quite unusual merit, securing a new romantic element in certain of the aspects and contrasts of modern Oriental life. His works include: "Dr. Claudius" (1883); "To Leeward" (1883); "A Roman Singer" (1884); "Zoroaster" (1885); "A Tale of a Lonely Parish" (1886); "Saracinesca" (1887); "Marzio's Crucifix" (1887); "Paul Patoff" (1887); "Greifenstein" (1889); "Sant Ilario" (1889); "A Cigarette-Maker's Romance" (1890); "The Witch of Prague" (1891); "Khaled" (1891); "The Three Fates" (1892); "Katharine Lauderdale," and its sequel "The Ralstons"



F. MARION CRAWFORD

(1895); "Casa Braccio" (1895); "Taquisara" (1896); "A Rose of Yesterday" (1897); "Corleone" (1897); "Ave, Roma Immortalis," "In the Palace of the King," "Via Crucis," "Rulers of the South." He died April 8, 1909.

CRAWFORD, THOMAS, an American sculptor; born in New York City, March 22, 1814. His most famous works comprise "Orpheus and Cerberus," "Adam and Eve," "Hebe and Ganymede," "Mercury and Psyche," and "Dancing Jenny." He performed important works for the National Government and State of Virginia. He died in London, Oct. 16, 1857.

CRAWFORD, WILLIAM HARRIS, an American statesman; born in Amherst co., Va., Feb. 24, 1772. In 1783, he settled in Columbia co., Ga., began teaching school, was admitted to the bar in 1798, and entered on practice in Lexington. He assisted in compiling the first digest of State laws, was elected to the State Senate in 1802, and to the United States Senate to fill a vacancy in

1807 (fighting two duels during the canvass); was re-elected for a full term in 1811; was chosen president of the Senate pro tem. in 1812; and, refusing the secretaryship of war, was appointed minister to France in 1813. Two years later he was appointed Secretary of War, and the next year became Secretary of the Treasury, and held the latter office till March, 1825. He was urged as a candidate for the Presidency several times, received the nomination in 1824, and in the election had 41 electoral votes. No choice for President having been reached, the election was decided in the House of Representatives, but meanwhile Crawford had been stricken with paralysis, which precluded his effectual candidacy. He died Sept. 15, 1834.

CRAWFORD, WILLIAM HENRY, an American educator; born in Wilton Center, Ill., in 1855. He graduated from Northwestern University in 1884. After studying at the Garrett Biblical Institute he was ordained to the Methodist ministry in 1884. After serving in several pastorates, he was appointed professor of historical theology at the Gammon Theological Seminary of Atlanta, serving from 1889 to 1893. In the latter year he became president of the Allegheny College. He lectured widely on historical subjects and was a frequent contributor to magazines and newspapers. He was a trustee of the Carnegie Foundation, a member of the Federation for Social Service and other organizations, and the author of "Life of Savonarola" (1906); "The Church and the Slums" (1908); "The American College" (1915). During the World War he was National War Work Council secretary of the Y. M. C. A.

CRAWFORDSVILLE, a city and county-seat of Montgomery co., Ind.; on the Chicago, Cleveland, Cincinnati and St. Louis, the Vandalia, the New York Central, and the Chicago, Indianapolis and St. Louis railroads; 44 miles W. of Indianapolis. It is the trade center of an extensive agricultural region. It is the seat of Wabash College, and has foundries, planing and flour mills, electric lights, water works, high school, daily and weekly newspapers, 3 National banks, etc. Pop. (1910) 9,371; (1920) 10,139.

CRAYON, a colored pencil consisting of a cylinder of fine pipe-clay colored with a pigment. Crayons are said to have been made in France in 1422.

In lithography, a composition formed as a pencil, and used for drawing upon lithographic stones.

CREAM, the most oily part of milk. It is specifically lighter than the other constituents, and therefore rises to the surface, whence it is generally skimmed to be used as an adjunct in making tea and coffee palatable, to be eaten with various fruits, or for other purposes.

In chemistry, hydrogen potassium tartarate ($KHC_4H_4O_6$), a salt obtained from the crude tartar, or argol, which is deposited on the side of wine casks during the fermentation of grape juice. It is a gritty white powder which forms small rhombic prisms, is sparingly soluble in water, and insoluble in alcohol. Heated in a crucible it evolves inflammable gas and the odor of burned sugar, and leaves a black residue of charcoal and potassium carbonate. In small doses it is a refrigerant and diuretic; in large doses a powerful hydragogue purgative. It is given, mixed with jalap, as a purgative in cases of dropsy, and is used as a drink in febrile affections.

CREASY, SIR EDWARD SHEPHERD (krē-se), an English historian; born at Bexley, Kent, in 1812. He was educated at Eton, and at King's College, Cambridge, of which he was elected a fellow in 1834. He was called to the bar at Lincoln's Inn in 1827, and was for about 20 years a member of the home circuit. In 1840 he was appointed Professor of History at the London University, and in 1860 was made Chief Justice of Ceylon, receiving at the same time the honor of knighthood. His principal works are: "The Rise and Progress of the British Constitution," and "The Fifteen Decisive Battles of the World." He died Jan. 27, 1878.

CREATINE, methyl-glycocyamine. Methyl-guanido-acetic acid, $C_4H_9N_3O_2 + H_2O$, or $HN=C\overset{NH_2}{\underset{N(CH_3)—CH_2—CO\ OH}{}}$. Creatine is obtained from the muscular flesh of mammalia, birds, reptiles, and fishes. It has been found in the blood and urine, and brains of pigeons and dogs. It is obtained by chopping up the lean muscular flesh, removing the fat, and rubbing it with water and pressing it; the liquid is heated in a water-bath to coagulate the albumen, then strained; to the filtrate baryta-water is added, so long as it gives a precipitate, the filtrate concentrated on a water-bath, the crystals, which separate, decolorized by animal charcoal and re-crystallized from water. Creatine crystallizes in rhombic needles containing one molecule of water, which is driven off at 100°. The water solution has a bitter taste, and is neutral to litmus. It gives a white precipitate with silver nitrate, which is soluble in potash. After a time the solution solidifies to a transparent gelatinous mass, which is re-

duced when heated. Creatine heated gives off ammonia and hydrocyanic acid. Creatine is dissolved by strong acids; it loses a molecule of water, and is converted into creatinine. Creatine has been formed synthetically.

CRÉBILLON (krā-bē-yōn), **PROSPER JOLYOT DE**, a French dramatic poet; born at Dijon, in 1674. He was intended for the legal profession, but devoted himself to the tragic muse, and produced "Idomeneus," which met with success. This was followed by "Atreus," "Electra," and "Rhadamistus," which were still more successful. He then led a secluded life for many years, but again resumed his dramatic labors, and produced the tragedies of "Catiline" and "The Triumvirate." He died in 1762.

CRÉCY-EN-PONTHIEU, or **CRESSY**, a village in the French department of Somme, on the Maye, 12 miles N. of Abbeville. Crécy is celebrated on acount of the brilliant victory obtained here, Aug. 26, 1346, by Edward III., with 40,000 English soldiers, over a French army amounting, according to Froissart, to 100,000 men under the command of the Count of Alençon. In this great battle perished the flower of the French chivalry, as well as the blind King of Bohemia, who was fighting on the side of France. The Black Prince here distinguished himself greatly, and gained his spurs.

CREDIT, in economics, is the postponement agreed on by the parties of the payment of a debt to a future day. It implies confidence of the creditor in the debtor; and a "credit system" is one of general confidence of people in each other's honesty, solvency, and resources. By means of a credit system a comparatively small stock of money can be made to do duty for carrying on a number of different transactions; but it is indispensable for every good system of credit that money must be instantly available when required, and this principle applies to every species of transaction where postponed payment is concerned. Public credit is the confidence which men entertain in the ability and disposition of a nation to make good its engagements with its creditors; or the estimation in which individuals hold the public promises of payment, whether such promises are expressed or implied.

The term is also applied to the general credit of individuals in a nation; when merchants and others are wealthy and punctual in fulfilling engagements; or when they transact business with honor and fidelity; or when transfers of property are made with ease.

CREDIT, LETTER OF, an order given by bankers or others at one place to enable a person to receive money from their agents at another place.

CRÉDIT FONCIER (krā-dē'fôn-syā), a mode of raising money on land in France, the peculiarity of which is that the advance must not exceed one-half of the value of the property pledged or hypothecated, and that the repayment of the loan is by an annuity terminable at a certain date. Several companies have been established by the French Government with the privilege of making such loans.

CRÉDIT MOBILIER (-mō-bēl-yā'), the name given to a gigantic scheme promulgated in France in 1852, and sanctioned by the existing government, the objects of which are: 1. To take in hand and originate trading enterprises of all kinds, on the principle of limited liability. 2. To supersede or buy up trading companies; and to substitute script and shares of its own, for the shares and bonds of the company. The Crédit Mobilier of America was a corporation with a Pennsylvania charter, granted in 1859 nominally to conduct a banking business. The charter passed into the hands of railroad financiers in 1864, who used it to finance the Union Pacific Railroad and to shield themselves from loss in case the railroad proved a failure. Congress investigated the enterprise in 1872-1873, and two members of the House of Representatives, Oakes Ames, of Massachusetts, and James Brooks, of New York, were censured by resolution of the House.

CREDIT UNIONS, or co-operative banks, the members of which deposit savings, or invest in shares, and with the funds thus pooled extend credit to one another for individual, family, or business purposes. These local institutions sometimes federate into national institutions and so create powerful financial concerns, such as the Moscow Narodny (People's) Bank, which was doing a business of over a billion dollars a year before it was taken over by the Soviet Government, in 1919. In this country credit unions are of more recent origin, except in the form of building and loan associations, a form of co-operation which has existed in this country for the past two generations. The latter form of mutual credit differs only from the general credit union in that it has the specific object of helping its members finance building operations, while the credit union lends money for all purposes. Massachusetts leads in the formation of credit unions, there being over sixty in that State in 1920, with a membership of nearly 20,000 and assets of about

$2,000,000. Seven other States have followed Massachusetts in official recognition of this type of bank, while North Carolina has passed special legislation for fostering such institutions among farmers. The Russell Sage Foundation, New York City, devotes much energy to the encouragement of the formation of credit unions, and published a number of pamphlets on the subject.

CREED, CREDE, or CREDO, a summary of the articles or Christian doctrines of which the several churches profess their belief. In the Church of England three such creeds are accepted —viz., the Apostles' Creed, the Athanasian Creed, and the Nicene Creed. In the Church of Scotland the creed accepted is the Westminster Confession of Faith, to which may perhaps be added the Larger and Shorter Catechisms. The Church of Rome accepts the same creeds as that of England does, but adds to them the creed of the Council of Constantinople.

CREEL, GEORGE, an American journalist and author, born in Blackburn, Mo., in 1876. Educated in the public schools, he served in an editorial capacity on several newspapers in the West and did much special writing for magazines, especially on social and economic subjects. He was appointed by President Wilson as chairman of the Committee on Public Information, on April 14, 1917, and continued in this capacity until March, 1919. He had charge of the dissemination of propaganda in Europe during the war, and perfected a very complete organization for the promotion of publicity.

CREELMAN, JAMES, an American author born in Montreal, Canada, in 1859. Educated in the public schools of the Dominion, he later moved to New York City, where he served as a reporter and editorial writer for the New York "Herald." In 1890 he became the editor of the London edition and the year following of the Paris edition of the same newspaper. From 1892-1894 he acted as editor of the New York "Evening Telegram." During the Græco-Turkish, Cuban, and Spanish-American Wars he was a noted war correspondent. He was shot and badly wounded while fighting with the American forces for the capture of Santiago. From 1900-1906 he was editorial writer for the New York "World," and later for the New York "Evening Mail." He died Feb. 12, 1915.

CREIGHTON UNIVERSITY, an institution for higher education, founded in 1879, at Omaha, Neb., under the auspices of the Roman Catholic Church. In 1919 there were 130 instructors and 1,061 students. President, A. J. Burrowes, S. J.

CREMATION, the act of cremating or disposing of a corpse by burning instead of burying it. Cremation was practiced among the Greeks and Romans. The mass of the Hindus properly so called thus dispose of their dead, while the Mohammedans have recourse to burial. In 1873 an eminent physician, Sir Henry Thompson, advocated its introduction into England on sanitary grounds, but public feeling was against the innovation, and it made little progress there. Later, however, in many of the European countries cremation of the dead received the highest indorsement of the governments, while in the United States crematories were established in many of the cities. The first crematory in the United States was established at Washington, Pa., in 1876. It was first used for the incineration of the body of the Baron de Palm in December of that year. Other crematories have since been established in most of the large cities of the country.

CREMONA, a city of northern Italy, on the N. bank of the Po, 60 miles S. E. of Milan. Cremona has some fine buildings—the principal the cathedral (1107-1606), with gorgeous interior; the neighboring octagonal Baptistry; the Palazzo Publico (1245); the so-called Campo Santo; and the famous Torrazzo (1288) or belfry—the loftiest campanile in Italy, being 396 feet high, and commanding magnificent views over the fertile plains of Milan. By means of the Po, Cremona carries on a considerable trade in produce of the district; and it has manufactures of silk, cotton, earthenware, and chemicals. In the 16th, 17th, and 18th centuries it was greatly celebrated for its manufacture of violins, the most famous makers being the Amatis, the Guarneris, and Stradivari. Pop. about 43,000. Cremona is the capital of a province of the same name; area, 678 square miles. Pop. about 353,000.

CREOLE, a person, in either America or the West India Islands, of European progenitors; as, a Spanish creole. It is sometimes, also, applied, but wrongly, to any person born within tropical latitudes, of whatsoever color.

CREON, the King of Thebes, who, in the legend of the war against that city, forbade anyone to bury the bodies of Eteocles and Polynices, and condemned their sister Antigone to death for disobeying this order.

CRERAR, JOHN, an American philanthropist; born in New York City, about 1828. He entered mercantile life and accumulated a fortune, removing to Chicago in 1862, and adding to his wealth by railway financiering. He

readily bestowed large sums upon charitable undertakings, and in his will left $2,500,000 to found the John Crerar Public Library, from which sensational novels and skeptical works should be excluded. He died in Chicago, Oct. 19, 1889.

CRESCENDO, increasing; a gradual increase in the force of sound. Expressed by the sign <, or the abbreviation *cres.* The sign was first employed in England by Matthew Locke, in 1676.

CRESCENTIACEÆ, *crescentiads*, an order of perigynous exogens. It consists of small trees, with alternate or clustered exstipulate leaves and flowers growing out of the old stems or branches.

CRESS, the name of several species of plants, most of them of the natural order *Cruciferæ.* Water-cress, or *Nasturtium officināle*, is used as a salad, and is valued in medicine for its antiscorbutic qualities. The leaves have a moderately pungent taste. It grows on the brinks of rivulets and in moist grounds. Common garden cress is the *Lepidium sativum;* Normandy cress, *Barbarea præcox;* winter cress, *B. vulgāris;* Indian cress, *Tropæ̆lum majus;* bitter cress, *Cardamīne pratensis* (cuckoo-flower).

CRESSY. See CRECY-EN-PONTHIEU.

CRESTON, a city of Iowa and the county-seat of Union co. Its industries include machine shops, car works, planing mills, and cold-storage plant. It is on the Chicago, Burlington and Quincy railroad. There are a public library, Elks' Home, and other public buildings. Pop. (1910) 6,924; (1920) 8,034.

CRETACEOUS SYSTEM, the highest division of the Mesozoic or Secondary strata, rests conformably upon the JURASSIC SYSTEM, and is overlaid unconformably by the oldest deposits of the EOCENE SYSTEM. The Cretaceous strata of Great Britain are confined chiefly to the E. and S. E. of England. They form the Yorkshire Wolds, extend over large parts of Norfolk, Suffolk, and Hertford, and compose the Chiltern Hills, Salisbury Plain, the Downs, and the S. part of the Isle of Wight. On the Continent the Cretaceous rocks form a broad basin in the N. of France, and stretch E. from Belgium, Holland, Denmark, and the S. of Sweden, through the great plains of northern Europe to the S. end of the Ural Mountains; but over extensive regions within that wide area they lie more or less concealed under younger formations. There is another extensive development of Cretaceous strata in southern Europe, where they enter largely into the composition of many of the Mediterranean coast-lands. The chief petrological feature of the Cretaceous strata of western and northern Europe is the great development of white chalk in the Anglo-French area, and its gradual replacement, when following E. into Germany, etc., by earthy limestones, shales, sandstones, etc. The most marked characteristic of the Cretaceous system in southern Europe is the great development in that region of massive marine limestone (hippurite limestone).

In North America Cretaceous strata likewise occur, especially in the Western States and Territories. They also occupy wide tracts in the Gulf States, whence they extend up the Mississippi Valley to the Ohio; they put in appearance at intervals on the Atlantic border between South Carolina and New Jersey, and are met with again on the Pacific border and in the coast-range. Strata of the same age occur also in the far W. of Canada, at the mouth of the Mackenzie river, and in Greenland. In India the system is marked in the Deccan by a massive series of basalt-rocks 4,000 to 6,000 feet thick, and covering an area of 200,000 square miles. In Australia and New Zealand there is a considerable development of these rocks, such as the "desert sandstones" of Queensland, and a small coal-bearing group of beds. In New Zealand, the system contains coals, some of which are lignites while others are bituminous of fair quality. The Wealden Beds consist largely of clay and sand, and are almost entirely of fresh-water origin. In Yorkshire, however, the strata which occur on the same horizon as the Wealden Beds of the S. are of marine origin, as seen in the Speeton clay near Bridlington. The Lower Greensand, consisting of sand, clay, etc., is marine. The gault, a tough blue clay, is likewise marine, and so also are the shallow-water sands of the Upper Greensand, and the thin layer of chalky marl called Chloritic Marl. The most characteristic rocks of the system are the chalk beds.

The Cretaceous strata of Great Britain being almost exclusively of marine origin, it is not surprising that land-plants seldom occur, and that they are met with chiefly in the fresh-water beds near the base of the system. They consist chiefly of ferns, cycads, and conifers, a flora resembling that of the preceding Jurassic period. The Upper Cretaceous rocks of Germany, however, have furnished many plant remains. Among those are the oldest known dicotyledons, such as extinct species of maple, oak, walnut, beech, laurel, magnolia, etc., also several proteaceous plants. A similar

admixture of forms occurs in the Cretaceous strata of North America. Among animals the protozoa played a very important part—the white chalks and earthy limestones being very largely composed of the minute shells of foraminifera, such as globigerina, rotalia, and textularia, which still swarm in the ooze of the Atlantic. Ordinary bivalves were also very numerous. In the Danian beds carnivorous gasteropods begin to abound, and they include a number of existing genera. Cephalopods are not only the most abundant, but also the most characteristic fossils of the Cretaceous rocks. Among the fishes were ganoids, and various kinds of the shark tribe, together with the earliest representatives of the teleostei, which include most living genera of fishes. The waters of the period seem also to have swarmed with reptiles, such as the ichthyosaurus and plesiosaurus. Winged reptiles were also present, such as pterodactylus.

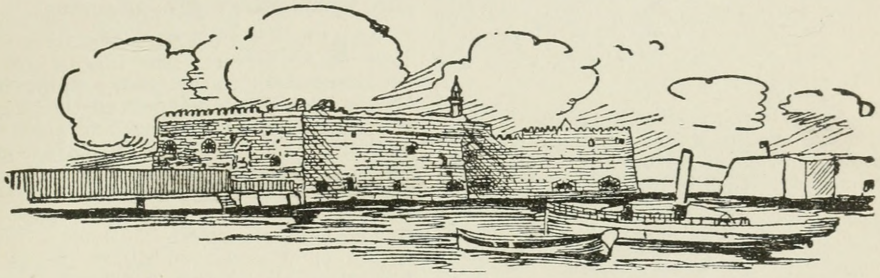
The American Cretaceous system is likewise characterized by the presence of huge dinosaurs and other reptiles, some of them being European types, while others are peculiar. One of the most remarkable features of the American rocks is the occurrence in them of the toothed birds, ichthyornis and hesperornis.

No break separates the Jurassic from the Cretaceous system; there is a gradual passage from the upper beds of the one into the lower beds of the other. At the beginning of Cretaceous times most of the British and Irish area existed as dry land. Over the S. E. of England lay the estuary of a large river, flowing probably from the N. The Wealden beds are the delta-deposits of that river; the English and French beds of this division covering an area of 20,000 square miles. The sea into which that river flowed occupied a considerable area in the N. of France, spread over the Low Countries into Hanover, filled the basin of the North Sea, and overflowed a portion of eastern England. Wealden beds occur in northwest Germany, and indicate the delta of a river, like that of the British area, flowing from the N. While land-conditions predominated in northern and middle Europe, an open sea covered vast areas in southern Europe. Gradual subsidence of the sea-bottom took place during the deposition of the Wealden series, and eventually the great deltas became submerged, and a wide sea covered most of what are now the low grounds of the British area, and passing E. submerged vast regions of middle Europe up to the slopes of the Ural Mountains. The depression was greatest in the W. areas where in the deep clear waters there gradually accumulated the calcareous matter which subsequently formed our white chalk. In the Mediterranean basin, a deep open sea would seem to have persisted all through the Cretaceous period. It was in this sea that the massive hippurite limestone was formed. Open water appears at this time to have extended through the Mediterranean area into Asia, covering there also vast tracts of what is now dry land, and communicating with the Indian Ocean. The conditions of climate seem to have been remarkably uniform over the vast regions of the earth's surface. Ferns, cycads, and conifers flourished in the lands within the Arctic Circle, and the waters of the same region were tenanted by cuttle-fish, ammonites, and huge reptiles.

CRETE, or **CANDIA**, an island belonging to Greece, the largest of the Mediterranean, except Sicily, lying S. of the Grecian Archipelago and the Ægean Sea. It is 150 miles long, and from 6 to 35 miles wide. Its area is 3,326 square miles. It commands the entrance to the Black Sea. The surface is mountainous, the highest peak being Mt. Ida, 8,061 feet in height; pop. about 350,000. Capital, Canea (pop. about 25,000). The island produces silk, wool, cotton, tobacco, lemons, oranges, grapes, olive oil, wines, and cereals. The population is mostly Hellenic. The Greek Church predominates, having eight bishops. The Mohammedan population is largely Greek. The history of Crete is very ancient, the island being in mythology regarded as the original seat of the human race. It was fabled to have been ruled anciently by Minos. Crete was conquered by the Turks in 1669, but never really submitted to Turkish authority.

There was a rebellion against Turkey in 1866, that was at length subdued. Another revolt broke out in 1897, during which many atrocities of the Turkish garrisons were reported. Feb. 14 it was announced that Greece had assumed responsibility of protecting the Christian inhabitants against the Sultan's forces. A Turkish transport, the "Fuad," on its way to re-enforce the Crete garrison, was fired upon by a Greek cruiser, and compelled to turn back. A regiment of Greek troops was dispatched to the island, and the army reserves of Greece called out. The Sultan notified the leading powers of the warlike action of Greece, and requested them to restrain the latter power. In answer to this request the powers—Germany, Italy, Great Britain, Austria, France and Russia—warned Greece that she must not occupy or invade Crete, and

when Greece, nevertheless, began to send troops and vessels to Crete, each of these powers landed a small force on the island, and took possession of several important stations, and the entire coast was patrolled by war vessels to prevent the Greeks from re-enforcing in the island. The Cretans attacked some of the Turkish forts, and were shelled by cruisers of the blockading fleet. Both Greece and Turkey began preparing for war. Ultimately, Greece yielded to the demand of the Powers, and withdrew her troops from Crete, the Powers undertaking to set up autonomy under the nominal suzerainty of the Sultan, and to secure the withdrawal of the Turkish forces also. The evacuation of the island by the Turkish troops was completed Nov. 6, 1898, and Prince George of Greece was appointed the high commissioner of the Powers in Crete.



FORT AT HARBOR ENTRANCE, ISLAND OF CRETE

In 1904-1905 there were revolts against the high-handed methods of the commissioner. A revolutionary assembly sought the annexation of the island to Greece, but the Powers forced them to abandon the attempt. In 1906 Prince George resigned. In 1910 Venizelos, Cretan leader and Premier of Greece, formed the Balkan League and, as a result of the Balkan War of 1912, Crete was annexed to Greece.

CRETINISM, a kind of idiocy prevalent in various Alpine valleys. In most, if not in all cases, the afflicted person has an ugly swelling called a goître on the neck. The mental deficiency varies in degree, being in some cases so great that the unhappy person thus affected is unable to do anything for himself, and cannot even articulate words; in others there are some faint glimmerings of mind.

CREUSE (krez), a river and a department in the center of France. The river rises near Féniers, on the N. slope of Mont Odouze, and flows 146 miles N. W. till it falls into the Vienne, a tributary of the Loire, 12 miles N. of Chatellerault. The department has an area of 2,163 square miles. Pop. about 266,000.

CREUSOT, LE (krez-ō′), a town in the French department of Saone-et-Loire, 236 miles S. S. E. of Paris. Situated in the midst of a district rich in coal and iron, it owes its importance to the establishment here in 1837 of the great ironworks of Schneider & Co., which rank among the largest in the world. In normal times over 15,000 men are employed. During the World War the number of workers was more than doubled.

CREWE, ROBERT OFFLEY ASHBURTON CREWE-MILNES, MARQUIS OF, a British statesman. He was born in London, 1858, and was educated at Harrow and Trinity College, Cambridge. He was Assistant Private Secretary to the Secretary for Foreign Affairs (Earl Granville), 1883-1884; Lord-in-Waiting to Queen Victoria, 1886; Lord Lieutenant of Ireland, 1892-1895; Lord President of the Council, 1905-1908; and 1915-1916; Lord Privy Seal, 1908 and 1912-1915; Secretary of State for the Colonies, 1907-1910; Secretary of State for India, 1910-1915; President of the Board of Education, 1916; Chairman L. C. C., 1917. He is H. M. Lieutenant of the County of London; Elder Brother of Trinity House; and Chancellor of Sheffield University. His works include: "Stray Verses," and numerous political and literary articles.

CRIBBAGE, a game played by two persons with a complete pack of 52 playing-cards. It is divided into two classes; the five-card and six-card games. The five-card is the original game, and affords the greatest scope for the exercise of skill. The points are scored upon a board, and 61 points constitute the game. All the kings, queens, knaves, and tens count as ten each, and the rest of the cards acording to the ordinary value; that is, six for six, five for five, and so on. The points which reckon for the

game are fifteens, sequences, flushes, pairs, etc. After dealing, the players gather up their cards, and having taken out two each, place them, with their faces down, on the table. These four cards form the crib, which becomes the property of the dealer, under certain conditions. Points are scored in two different ways in cribbage—first in play, and second in reckoning up the cards held. After the crib is put out, the pack is cut by the non-dealer, and a card turned up by the dealer. When this card is a knave, it is called two for his heels, and counts two to the dealer; and a knave held in hand, of the same kind as the turn-up card, entitles the player to score one; it is called one for his knob. A six-card cribbage is played in a very similar manner, but is inferior in science to five-card cribbage. When three parties play at the game, each plays on his own account; and when four play, sides are generally chosen.

CRICHTON, JAMES (krī'ton), surnamed THE ADMIRABLE; born in Scotland, in 1560. His father was a lord of session, and through his mother he was of royal descent. He was educated at the university of St. Andrew's, and graduated M. A. in 1575. He was one of the young men selected to be fellow-students of the young king, James VI., under the direction of George Buchanan. He then went to France, where he continued his studies, and also, as he adhered to the Roman Church, took part in the war carried on by Henry III. against the Huguenots. The beauty of his person, the strength and agility he displayed, joined to his multifarious accomplishments and surprising capacity of eloquent talk, made him the admiration of all. About 1580 he went to Italy, visiting probably Genoa and Rome, and then Venice, where he was warmly received by the great printer Aldus. He was introduced to the Doge and Senate, created astonishment at Venice and Padua, by his brilliant off-hand discourses on philosophy, theology, and other high themes, and his challenge to disputation in any of several languages, and on either side of any controversy. He next went to Mantua, and was appointed tutor to the son of a duke. Attacked in the streets one night by a party of men armed and masked, he overcame them by his superior skill, and recognized his pupil, to whom he at once presented his sword. The young prince immediately ran him through with it, July 3, 1582.

CRICKET, the name given to any insects of the genus *Acheta*, or the tribe *Achetina*. The antennæ are long and tapering, the wings are laid flat upon the back. When at rest they are folded, but are so long that they project behind the wing-cases. The tail ends in two bristles, besides which the female has an ovipositor. The best known species are the following: The common cricket or house cricket. Its appropriate habitat is the kitchen hearth, where it makes its presence known by its song. The field cricket is found in burrows among stones and sand. The mole cricket has curious mole-like hands or hand-like organs, admirably adapted for digging.

CRICKET, a well-known game, played in the United States, Great Britain, Australia, and India, the players being arranged in two contesting parties of 11 each. Strutt, one of the best English authorities on ancient sport, adduces some evidence to show that "club-ball," played in the 14th century, may have been the parent of cricket.

Cricket stands pre-eminent in England among the many outdoor pastimes pursued during the summer months. Cricket is not solely an affair of skill; chance is also a factor to a very large extent. To excel at cricket it is necessary that the study of the game should begin early, as a great deal of patience and practice is requisite. At nearly all, if not all of the English public schools, a cricket "coach" or tutor is engaged.

Cricket may be played either single-wicket or double-wicket, but it is now so rarely played in the former manner that we can safely confine our attention to the latter. For a double-wicket match game 11 players on a side are necessary, and after the captains have tossed to settle who shall go to the bat first, the loser places his field and the winner sends in two of his surest, safest batters to defend the wickets and to make runs. The disposition of the field depends upon the style of bowling, whether it be fast, medium pace or slow, and the following diagrams will give a pretty clear idea of how the fielders are placed and what dangers the batsman has to guard against. A distance of 22 yards separates the wickets, and by the scale the relative position of the players may easily be estimated. The field having been duly placed, the batsmen having taken their stand, with legs carefully protected by pads, and hands by ingenious rubber gloves, the umpire calls "play," and the bowler sends down his first ball. After five balls have been delivered from one wicket the umpire calls "over," and the whole field changes about till the position of the men bears the same relation to the other wicket that it did to the one first bowled against. These "overs" continue to be bowled from alter-

nate ends by different bowlers until the whole 11 players have tried their hand at the bat and been disposed of. Runs are made by the batsman driving the ball far enough away to give him time to change places with the other batter before the ball returns. Each change constitutes a run, and in matches in England it has sometimes happened that one batsman has made over 400 runs in this way. Six is the largest number of runs that can be made from a single hit, that being what is allowed when the ball is driven clear out of the grounds. The business of the bowler is to try in every possible way to knock down the wickets in front of which the batsman stands, or else to tempt him into hitting the ball up into the air so that it may be caught on the fly by one of the fielders. Besides being bowled or caught out, a batter may be "run out," *i. e.*, have his wicket knocked down by the ball while he is busy making a run, or he may be "stumped out," which is to have the same thing happen when he incautiously steps out of his ground to hit at an unusually tempting ball. The ball comes to the batter on the first bounce, and the bowler's skill is shown in varying the pitch, speed, and direction of the ball so that the batter may become bewildered and fail to defend his wickets. The best kind of bowling is what is known as a "bowling with a break," the peculiarity of which consists in that the ball after striking the ground does not continue straight on, but swerves sharply to the right or left like a "cut" tennis ball, a kind of bowling, therefore, which bears much the same relation to the ordinary that "curve pitching" does to the old-fashioned style. It is not easy to acquire, and few have the art in perfection. In the United States the two chief homes of cricket are in Philadelphia and Boston, although there are good clubs in New York, Detroit, and elsewhere, and also at some of the larger colleges.

CRIMEA, THE (anciently, Chersonēsus Taurica), a peninsula of southern Russia, government of Taurida, to the mainland of which it is attached by the Isthmus of Perekop; area, 10,000 square miles. On the W. and S. it is washed by the Black Sea, and on the E. by the Sea of Azof, a portion of which, shut off from the rest by a long and narrow strip of land, forms the Sivash or Putrid Sea. Three-fourths of the Crimea belongs to the region of steppes, but the other part, confined entirely to the S., and stretching along the coast from W. to E., abounds in beautiful mountain scenery. Here the valleys looking S. are luxuriant with vines and olive and mulberry plantations, while the N. slope gives a large yield in cereals and fruits. The climate, however, is unequal, and in winter is severe. The chief stream is the Salghir. Others of celebrity are the Tchernaya and the Alma. The most important of the productions, besides those already mentioned, are tobacco, of which a large quantity of excellent quality is produced, flax and hemp. The forests are of limited extent. There are large numbers of fine-wooled sheep and horned cattle and horses are reared in large numbers. Pop. about 500,000. The chief town and port is Sebastopol.

The country was anciently associated with the Cimmerians, and in later times with various Greek settlements and minor kingdoms. After being for some time a dependency of Rome, it was overrun by successive bodies of barbarians, and in 1237 fell into the hands of the Mongols under Genghis Khan. About 1261 the Genoese were permitted to occupy and fortify Kaffa, and they rapidly extended their power in the formation of other settlements. They were expelled, however, in 1475 by Mahomet II., who made it a dependent khanate. In 1783 the Russians took possession of the country; and with the view of overawing the Turks the great naval arsenal of Sebastopol, occupying the most commanding position on the Black Sea, was begun by Catharine II. in 1786. Its military resources were steadily developed up to the time of the Anglo-French campaign of 1854, when it fell into the hands of the allies. Here, in November, 1920, the Anti-Bolshevist leader, General Baron Wrangel, and his forces suffered a great defeat from the red army.

CRIMEAN WAR, the struggle between England, France, and Turkey on the one hand, and Russia on the other, to prevent the undue preponderance of Russia in the E. of Europe, which occurred in 1854 to 1856. The old plans for the extension of Russian power conceived by Catharine II. and Potemkin were resuscitated by Nicholas I., who, believing that he had secured himself from interference on the part of Austria and Prussia, and that an Anglo-French alliance was impossible, prepared to carry them into action. Servia, Bosnia, Bulgaria, and the principalities of the Danube were to become Russian protectorates, and Constantinople was to be provisionally occupied by Russian troops. The first markedly aggressive step—the demand by Russia for a protectorate over the Greek Church throughout the Turkish empire—brought matters to a crisis.

An ultimatum presented by Menschikoff in May, 1853, was rejected by the Porte; the Russians occupied the Danu-

bian principalities; and war was declared by the Porte in October, 1853; by France and England in 1854, and by Sardinia in 1855. A French and English fleet entered the Baltic and captured Bomarsund and one of the Aland Islands, and in the S. the allies landed at Varna, under Lord Raglan and Marshal St. Arnaud as commanders-in-chief. While the allies were making preparations Prussia and Austria demanded the evacuation of the Danubian principalities, and an evacuation being ordered by Nicholas, "for strategic reasons," the principalities were provisionally occupied by the Austrians. It soon became obvious that the Crimea must be the seat of the war, and 50,000 French and English troops with 6,000 Turks were landed at Eupatoria (September, 1854). Five days later the battle of Alma was won by the allies (Sept. 20), and the march continued toward the E. side of Sebastopol. Soon after St. Arnaud died and was succeeded by Canrobert.

The siege of Sebastopol was begun by a grand attack which proved a failure, and the Russians under Liprandi retaliated by attacking the English at Balaklava (Oct. 25), but were defeated with heavy loss. It was at this battle that the famous, but useless, charge was made by the Light Brigade. A second attack at Inkermann was again repulsed by the allies, but the siege works made slow progress during the winter, in which the ill-supplied troops suffered great privations. The death of Nicholas and succession of Alexander II., in March, 1855, brought no change of policy. Canrobert resigned in favor of Pélissier; and shortly after an unsuccessful attack on those parts of the fortifications known as the Malakhoff and Redan Lord Raglan died, and was succeeded by Simpson. The bombardment was continued, and in September the French successfully stormed the Malakhoff, the simultaneous attack on the Redan by the British proving a failure. The Russians, however, then withdrew from the city to the N. forts and the allies took possession. The chief subsequent event was the capture of Kars in Asia, by the Russians after a splendid defense by the Turks under General Williams. By this time, however, the allies had practical possession of the Crimea, and overtures of peace were gladly accepted. A treaty was accordingly concluded at Paris on April 27, 1856, by which the independence of the Ottoman Empire was guaranteed.

CRIMINAL LAW, that branch of law which deals with crimes and their punishment and is in use in one shape or another wherever human society exists. The earliest form of penal law seems to have rested on a principle of private vengeance, and to have taken shape in the *lex talionis*, the law of retaliation formulated in the familiar passage in Exodus which lays down as a fit punishment an eye for an eye and a tooth for a tooth. The severity of this doctrine was mitigated when the right of personal vengeance was satisfied by a money payment, a custom which can be traced in the early laws of the Hebrews, Greeks, and Romans, and which is particularly characteristic of early Teutonic systems of penal law. According to these a family is made pecuniarily responsible for the offenses of its members, or accepts a fine as a compensation for the life of a lost kinsman. When a man was killed, a part of this fine was paid to the king or head of the community to compensate the clan's loss of a fighting member; and in the distinction established between injuries done to the individual and injuries done to the community, the foundation of a system of criminal law was laid. The sovereign power in a community or state took up the wrongs of private persons and exercised a right of public vengeance. Legislation upon this principle had for its object the intimidation of the wrongdoer, and was specially characterized by the great variety and severity of its punishments. It was not until the 18th century that a more enlightened jurisprudence prevailed. Beccaria's work, "On Crimes and Punishments," published in 1764, has exercised a strong influence on criminal legislation by urging the claims of criminals to humane consideration, and examining the basis in morals upon which criminal law rests. The modern view gains ground that crime is to be looked upon as a disease of the social body, and that the remedy is to be looked for rather in improved education and social well-being than in a repressive system of arbitrary punishments. The criminal law of a particular state is the body of legal rules affecting the commission and prosecution of crimes.

CRIMINOLOGY, a term denoting the branch of anthropology which deals with crime and criminals, sometimes called "criminal anthropology." The science is largely based on the researches and views of Dr. Cesare Lombroso, born of Jewish stock at Verona in 1836, who, after serving as an army surgeon and holding posts as professor of mental diseases at Pavia and director of a lunatic asylum at Pesaro, was appointed Professor of Forensic Medicine and Psychiatry at Turin. His great work is "The Delinquent Man" (1875), in which his theory of criminology is expounded. The criminologist holds that the con-

genital habitual criminal is marked by conspicuous physical and mental defects. Arrested cranial development and deformity, heavy jaws, ugly features, and many other minor abnormal physical characters, are associated with moral insensibility, low intelligence, vanity, and irregular emotional peculiarities verging on insanity. The occasional criminal who yields to severe or special temptations is treated as belonging to a wholly distinct category. The acceptance of these anthropological views would naturally lead to somewhat sweeping changes in the treatment of criminals, with a view to their reclamation somewhat on the lines of the treatment in use at Elmira. See also BERTILLON SYSTEM.

CRIPPLE CREEK, a town in Teller co., Col.; on the Florence and Cripple Creek and the Midland Terminal railroads, 50 miles W. of Colorado Springs. It is the trade center for the Cripple Creek mining district, which was one of the richest gold-mining districts. It has several cyanide mills, smelters and other mining industries, a National bank, and daily and weekly newspapers. It was founded in 1890, and was nearly destroyed by fire in 1896. Pop. (1910) 6,206; (1920) 2,325.

CRISHNA, in Hindu mythology, an incarnate deity of perfect beauty. King Canza, being informed that a child of the family of Devaci would overturn his throne, gave orders to destroy all the male infants that were born. When Crishna was born, his nurse attempted to poison him, but failed, and the mother and child fled, and were taken care of by a shepherd. As he grew up, his beauty was so divine that all the princesses of Hindustan fell in love with him, and even to the present hour he is the Apollo of India and the "idol of women."

CRISIS, ECONOMIC, a term employed to denote the succession of phenomena, recurring at regular intervals in the industrial cycle, arising from disturbances and general depression in business following a period of prosperity. This alternation of prosperity and depression has become so marked a feature of recent economic history as to wear the appearance of a natural law, and, though the causes that lie at its foundation have not been fully ascertained, students of economics have begun to look on it as an inevitable accompaniment of the existing industrial order. The course of the crisis has been so pronounced that its characteristics are easily described. There is first of all the current of prosperity with growing business and expansion in industry and commerce, and then the period of uncertainty arising from the great increase in cost. A diminished volume of operations follows, with less demand for material and labor. So the decline of demand is felt in ever widening circles until the whole industrial world becomes sensible of the commercial depression. A condition of general anxiety supervenes, in the course of which a catastrophe of some kind, the failure of a great mercantile firm, drags the depression to a lower level by bringing down with it other firms having relations with it.

The repercussion is felt in many directions throughout the business world, confidence undergoes a process of further demoralization, creditors call in their debts, debtors, however solvent, find it harder to get credit, and the whole system of credit shows signs of crumbling. The demoralization may take on huge proportions and business may become almost stagnant. Then follows a period of quiescence, during which the psychological influences at work are apt to run their course. Then follows a general sense that the worst has passed, and since a state of quiescence becomes in time intolerable, the wheels begin to work again, and out of the depression confidence and credit begin to build their structure again. So the cycle runs its course, the period of prosperity again being followed by a period of depression and disturbance, and this again having run its course, confidence and increased production return.

Crises of the kind described are of course more rare than the disturbance regularly referred to in the press. There are crises of a less important kind, those leading to and resulting in panics in the money market. These do not always affect the commercial or industrial world in any appreciable degree. Of more import are crises having their intrinsic causes in the commercial and industrial world, for these last affect the actual wealth of a country, while a stock exchange crisis is apt merely to affect the symbols of wealth. A crisis in the industrial world generally betokens a period of hard times, which often extends itself, owing to the tightening of international relations, to several countries. A succession of bad harvests, for example, would be quite apt to cause enormous distress and dislocation of trade, with the result of successive periods of crises in different countries. One of the worst crises in the history of United States business was that of 1873. It exhibited in full-blown investiture all the characteristics of crises that have occurred before or since, the great industrial activity following the Civil War,

the years of prosperity, the period of overconfidence, the sudden failures here and there of conspicuous landmarks in the mercantile world, the increase of other failures, the panic and decline, the stagnant condition, and then the gradual return of confidence and activity after the lowest point had been reached in 1876. The list of business failures in those years tells the tale.

Year	Number	Liabilities
1871	2,915	$85,252,000
1872	4,069	121,056,000
1873	5,183	228,499,000
1874	5,830	155,239,000
1875	7,740	201,000,000
1876	9,092	191,117,000
1880	4,735	65,752,000

CRISP, CHARLES FREDERICK, an American jurist; born in Sheffield, England, Jan. 24, 1845; removed to Americus, Ga.; served in the Confederate army from 1861 to 1864; was admitted to the bar in 1866; was Solicitor-General of the State from 1872 to 1877; he was Judge of the Supreme Court from 1877 to 1882. He resigned the last office to accept a nomination for Congress, of which body he was chosen speaker in 1891, and again in 1893. He died at Atlanta, Ga., Oct. 23, 1896.

CRISPI, FRANCESCO, an Italian statesman; born in Ribera, Sicily, Oct. 4, 1819. He studied law at the University of Palermo and settled at Naples in 1846. Since then he has been an important factor in Italian history. He took part in the conspiracies that led to the overthrow of the Two Sicilies, after which he fled to France for a time; served as a major under Garibaldi in 1860, and in 1861 was returned by Palermo to the first Italian Parliament, and became President of the Chamber of Deputies in 1876. He was made Minister of the Interior in 1877, Prime Minister in 1887 and again in 1893. He was a warm friend of Bismarck. He became unpopular with the people on account of taxation and two attempts were made to assassinate him. He died Aug. 11, 1901.

CRISPIN, saint and martyr; about the middle of the 3d century, under the reign of Diocletian, fled, along with his brother Crispinian, from Rome, into Gaul, where he worked as a shoemaker in the town which is now called Soissons, and distinguished himself by his exertions for the spread of Christianity, as well as by his works of charity. In A. D. 287 he and his brother suffered martyrdom by being thrown into a caldron of molten lead. Both are commemorated on Oct. 25. Crispin is the universally recognized patron saint of shoemakers.

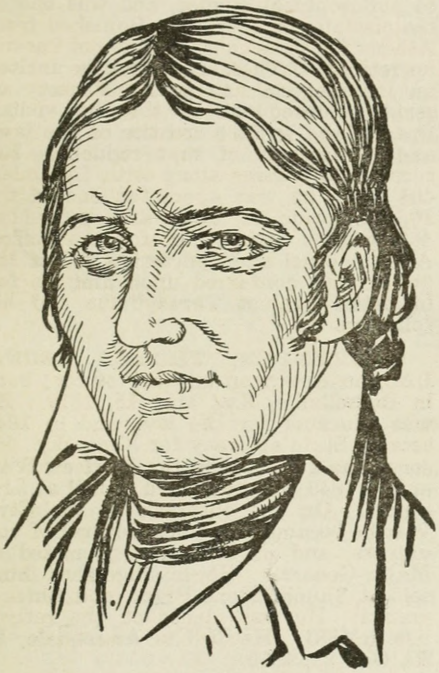
CRITIAS, one of the 30 tyrants set over Athens by the Spartans. He was of good family, and a man of considerable talents, but of dangerous principles. He cultivated eloquence and Cicero cites him among the public speakers of that day. He also had a talent for poetry, some fragments of which have reached us. Critias turned his attention likewise to philosophical studies, and was one of the disciples of Socrates. Banished from Athens for some cause that is not known, he retired to Thessaly, where he incited an insurrection among the Penestæ or serfs. Subsequent to this he visited Sparta, and wrote a treatise on the laws and institutions of that republic. Returning to Athens along with Lysander, 404 B. C., he was appointed one of the 30, his pride of birth and hatred of demagogues fitting him for that office. After a cruel and oppressive use of the power thus conferred upon him, he fell in battle against Thrasybulus and his followers.

CRITTENDEN, THOMAS LEONIDAS, an American military officer; born in Russellville, Ky., May 15, 1819. He was educated for the law, and in 1842 became State attorney for Kentucky. He served as an officer in the Mexican War, and in 1849 was appointed consul at Liverpool. On the outbreak of the Civil War he became Brigadier-General of volunteers, and in 1862 was promoted to Major-General. He distinguished himself at Shiloh, Stone River, and Chickamauga. He was placed on the retired list in 1881. He died in Annandale, N. Y., Oct. 23, 1893.

CROATIA-SLAVONIA, formerly a province or administrative division in the S. W. of the Austrian dominions in the Hungarian portion of the monarchy, partly bounded by the Adriatic. Since the World War a province of Greater Serbia (Jugoslavia). Area, 16,417 square miles. Its surface is irregular, the Alps extending into it, and culminating at the height of 4,400 feet. The Drave and the Save divide between them the whole drainage system. In the N. on low sunny slopes, the vine is successfully cultivated; the olive, mulberry, and fig thrive well on the coast. The S. is generally unfertile, and in many parts almost sterile. The principal crops are barley and oats; but the whole country is more pastoral than arable. The inhabitants are Croats and Serbs, with a mixture of Germans, Hungarians, Jews, and Gypsies. About three-fourths of the ponulation are Catholics, the rest belong chiefly to the Greek Church. Capital,

Zagrab. Pop. 2,650,000. In A. D. 640 the Croats, a tribe from the Carpathians, settled in Croatia, and gave their name to the country. It long maintained a sort of independent existence, but in 1309 it was incorporated with Hungary. See JUGOSLAVIA.

CROCKETT, DAVID, an American pioneer hunter, politician and humorist; born in Limestone, Tenn., Aug. 17, 1786.



DAVID CROCKETT

He was member of Congress from Tennessee and served in the Texan War. He wrote his "Autobiography" (1834); "Tour to the North and Down East" (1835); "Sketches and Eccentricities" (1847); etc. He was killed at Fort Alamo, San Antonio, Tex., March 16, 1836.

CROCKETT, SAMUEL RUTHERFORD, a Scotch novelist; born in Little Duchrae, Galloway, in 1860. He was a tutor and university pupil-teacher at an early age; but a volume of verse, "Dulce Cor," and "The Stickit Minister," volume of prose stories, showed literature to be his vocation. "The Raiders," "Mad Sir Ughtred of the Hills," "The Lilac Sun-Bonnet," "The Men of the Moss Hags," "Sweetheart Travelers," "Cleg Kelly, Arab of the City," "The Grey Man," "The Moss Troopers" (1912), "Sandy's Love Affair" (1913), are among his books. He died April 18, 1918.

CROCODILE, a huge reptile, in general contour most resembling a great lizard, found in or near the Nile and some other rivers. It is the *Lacerta crocodilus* of Linnæus, the *Crocodilus vulgaris* of Cuvier. Its jaws project moderately; there are six cervical plates; the dorsal shields or scutcheons are quadrangular and surrounded by six rows of slightly elevated carinæ. The hinder feet are palmated, their posterior border with a festooned crest. It is about 25 feet long. At least four varieties of it exist. It was held sacred among the ancient Egyptians. The Nile was and is its best known habitat.

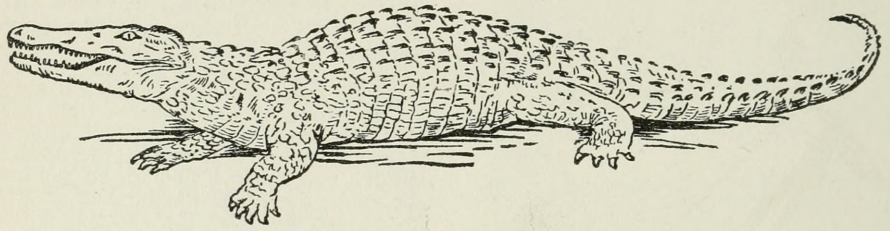
The leviathan of Job is almost certainly the crocodile, but in other parts of the Scripture different animals are designated by the same word.

CROCUS, a genus of *iridaceæ*. The perianth, which is single, is colored. The tube is long and the limb cut into six equal segments. The root a corm, the leaves grassy. The appropriate habitat of the crocuses is in the S. and E. of Europe and in Asia Minor. Some are vernal, others flower in autumn. *C. luteus* is the common or large yellow crocus. It was carried from Turkey to various parts of Europe in A. D. 1629. *C. mæsiacus*, imported from Greece in the same year, may not be distinct; nor may *C. aureus*, the small yellow crocus, also from Greece. *C. lagenœflorous*, another Greek species, has red-yellow, pale-yellow, and more typical yellow varieties. *C. vernus* is the common purple or white spring crocus. *C. sativus* is an autumnal plant, brought from the East. It has long been cultivated for its long reddish-orange drooping stigmas, which when dried become the saffron of the shops. According to Gussone *C. odorus* furnishes Sicilian saffron.

CRŒSUS, the fifth and last king of Lydia. He succeeded his father Alyattes, 560 B. C. He was so successful in all his enterprises that he soon became one of the richest monarchs of that time. He asked the philosopher Solon what he thought of his good fortune. "I pronounce no man fortunate until his death," was the reply. Crœsus was made prisoner by Cyrus, King of Persia. When bound to the stake and about to be burned to death, he recalled the words of Solon, and thrice repeated his name. Cyrus demanded an explanation. Crœsus gave it, and Cyrus not only spared his life, but also took him into his favor. At the death of Cyrus he recommended Crœsus to the favor of Cambyses, who

treated him with great cruelty, and ordered him to be put to death.

CROFTERS, petty farmers renting a few acres of land, with sometimes the right of grazing their cattle in common on a piece of rough pasture. Crofters are numerous in the Highlands, and in the western islands of Scotland, as well as in some other localities. From many districts they have been removed owing to their holdings being absorbed in sheep farms or deer forests, and they are now mainly congregated on the seashore, where they may partly maintain themselves by fishing. The Crofters' Act, passed in 1886, provides for security of tenure, the fixing of a reasonable rent, compensation for improvements, enlargement of buildings, etc.



CROCODILE

CROKER, RICHARD, an American politician; born in Black Rock, Ireland, Nov. 24, 1843; came to the United States in early life. He was Alderman of New York three times, and in 1889-1890 was City Chamberlain. He became prominent in politics during the scandal of the Tweed ring, whose schemes he vigorously opposed; was from 1884 to 1903 at the head of Tammany Hall; and was long the Democratic dictator of New York State and City, and conspicuous in the National affairs of his party. In 1903 he retired to a country estate in Ireland. In 1908 he was made a freeman of Dublin.

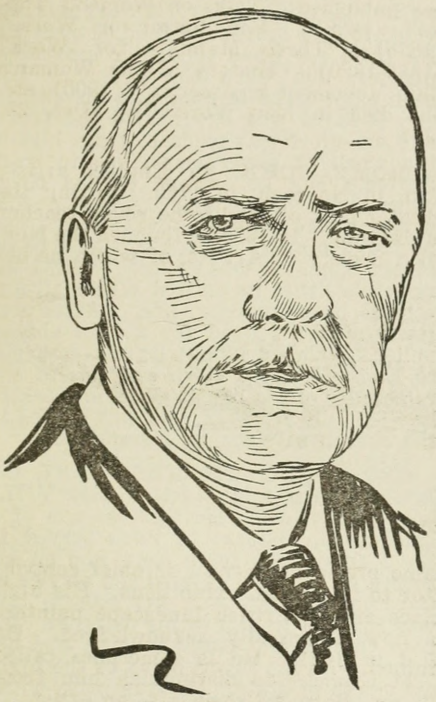
CROLY, HERBERT, an American author, born in New York in 1869. He studied at the College of the City of New York and at Harvard University. From 1900 to 1906 he was editor of the "Architectural Record," and from 1914 was editor of the "New Republic." He was a member of the National Institute of Arts and Letters. He wrote "Promise of American Life" (1909); "Life of Marcus Alonzo Hanna" (1912); and "Progressive Democracy" (1914).

CROLY, JANE (CUNNINGHAM), widely known by her pen-name of "Jennie June," an American writer, wife of D. G. Croly; born in Market Harborough, England, Dec. 19, 1831; settled in New York City in 1841. From 1860 for many years she was editor of "Demorest's Magazine," and of other periodicals. She was one of the founders of "Sorosis" and its president for 14 years, and one of the most active promoters of the Federation of Women's Clubs. She has published: "Talks on Women's Topics" (1863); "For Better or Worse" (1875); "Three Manuals for Work" (1885-1889); "History of the Woman's Club Movement in America" (1900), etc. She died in New York City, Dec. 23, 1901.

CROME, JOHN, an English artist; born in Norwich, in 1769. During the greater part of his life he was a teacher of drawing. In 1805 he founded the Norwich Society of Artists, of which he became president as well as chief contributor to its annual exhibitions. His high place among British landscape painters is now universally acknowledged. He died in 1821. He is sometimes called "Old Crome," to distinguish him from his son, Bernay Crome, also an artist.

CROMER, EVELYN BARING, 1st EARL, a British statesman, born in Cromer Hall, Norfolk, in 1841. He was educated at Woolwich Academy and entered the Royal Artillery at the age of 17. After filling several posts, he visited the United States during the Civil War, where he made a study of military operations. From 1872 to 1876 he was private secretary of the Earl of Northbrook, who was then Governor-General of India. In 1877 he was appointed Commissioner of the Egyptian Public Debt. His efficient service on this board attracted wide attention and on the abdication of Ismail, the Khedive of Egypt, he was made Controller-General. After three years spent in India (1880-1883), he returned to Egypt as agent and consul-general. On his arrival in Egypt he found political conditions in a deplorable state. He proceeded to organize the government, placing internal conditions on a sound basis. He also reorganized the army. Through his skill in diplomacy, he was of great assistance to Lord

Kitchener in the conquest of Sudan. He was made a baron in 1892 and an earl in 1901. In his later years he was a minister in the diplomatic service. He took a prominent part in the negotiations leading up to the Anglo-French Declaration of April 8, 1904, by which France



EARL CROMER

acceded to the recognition of England's control of Egypt. Before his death he was chairman of a commission appointed to investigate the Dardanelles campaign. His published writings include "Staff College Essays," "The War Game," "Modern Egypt," "Ancient and Modern Imperialism," and "Political and Literary Essays," the third series of which was published in 1916. He died in 1917.

CROMLECH, an erection consisting of two or more stones standing like pillars, with a large flat, or rather a slightly inclined one, placed upon the top, so as to make the whole present a rude resemblance to a table. Two fine cromlechs exist at Plas Newydd in Anglesea; others, less notable, are scattered through Wales; they exist also in Scotland, Jersey, Brittany, and throughout the Celtic area. Formerly they were generally held to be old altars for sacrifices. Modern opinion holds them to have been sepulchers. A cromlech is called also a dolmen. Somewhat similar erections are seen in various parts of Europe, in Arabia, in India, and North and South America.

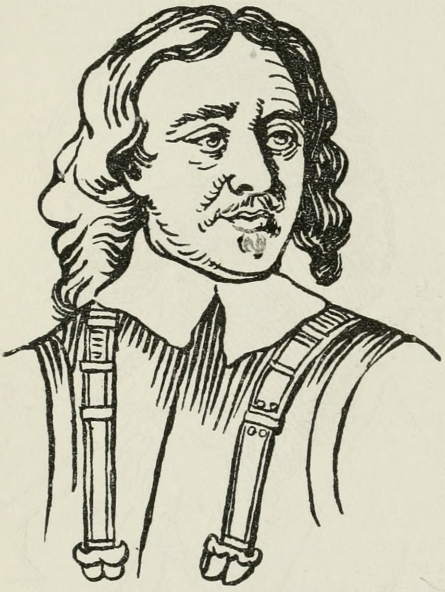
CROMWELL, BARTLETT JEFFERSON, an American naval officer. Born in Georgia in 1840, he was appointed to the United States Naval Academy in 1857, graduating in the year the Civil War opened. He steadily rose in rank until in 1889 he attained the rank of captain. In 1901 he was appointed commander-in-chief of the South Atlantic Squadron with the rank of rear-admiral. The following year he commanded the American fleet in European waters. Placed on the retired list in 1902, he died June 24, 1917.

CROMWELL, OLIVER, LORD PROTECTOR OF ENGLAND, born in Huntingdon, England, April 25, 1599. His father was Robert Cromwell, of a family possessed of a baronetcy, and his mother being a daughter of Sir Thomas Stewart. When 21 years old he married Elizabeth, the daughter of Sir Thomas Bourchier, and thus, both by descent and alliance, he was a member of the higher class of country gentlemen. Though he had been elected to the brief Parliament of 1628, it was not till 1640 that he was known in the House of Commons.

He had been for some years establishing an influence with the Puritan party, who frequented his house and bowed to his strong judgment. He showed his great business capacities in the struggle of the Long Parliament, but it was not until the Parliament raised a military force, to which he brought a troop of horse, that his powers of organization and command were fully developed. He speedily rose to authority as lieutenant-general of the horse; and when he was specially exempted from the self-denying ordinance, so that he could both deliberate in Parliament and hold command, he became the most powerful man in the country. He showed his eminent sagacity in constructing the army, and infusing into it high spirit along with stern discipline. At the battle of Naseby, in 1645, it was seen in the signal destruction brought on the well-officered royal army how effectually he could strike with the weapon he had constructed. His military policy throughout was to despise secondary means and ends, but to invest himself with overwhelming power and crush his enemy. He saw the large share which artillery must bear in warfare, and anticipated modern generals in fostering that destructive arm. His repeated victories over the Royalists, his establishment of the predominance of the army over Parliament, and of the Independents over the Presbyterians; his relentless

exertions to bring Charles I. to the block, and his dismissal of the Parliament, are all great events in the history of the day, which cannot be narrated with sufficient distinctness without much detail.

In 1649 he conducted an exterminating war in Ireland, instigated by the ferocious principle that whatever human being opposed him should be put to death. In Scotland, where he saw there were more suitable materials for the sort of government he desired, he was rather a pacificator than an oppressor. It was on Dec. 16, 1653, that he took the title of Lord Protector, and became virtually King of Britain, and a king who submitted to very little constitutional restraint. How far he was sincere in the religious convictions by which he professed to be led, has been matter of endless debate. That he was under powerful religious impulses cannot be doubted—



OLIVER CROMWELL

the question arises as to the extent to which he really believed that by their power alone, and by no promptings of worldliness, he was driven on in his ambitious career. He was an enlightened internal reformer, showed himself equal to the hard task he had undertaken, and, by a magnanimous foreign policy, left England greater and more honored than he had found her. He did not succeed with his Parliaments, and had to rule mostly without them. At last care, anxiety, and growing perplexities wore him out; he became gloomy and suspicious; was overwhelmed by sorrow at the death of his favorite daughter, Elizabeth, Lady Claypole; fell sick, and died about a month after her, Sept. 3, 1658.

CROMWELL, RICHARD, third son of Oliver; born Oct. 4, 1626. By the deaths of his two elder brothers, Robert and Oliver, he became his father's heir. He was an amiable and popular but weak man, devoted to field sports and fond of pleasure. He lived for some time in comparative privacy, but when the Protector had been empowered to nominate his successor, Richard was brought to the front, and an effort was made to train him to the work of government, but in vain. Scarcely had he entered on his office, when the forces of anarchy, both parliamentary and military, broke loose, and he found himself utterably unable to restrain them. It was probably with little reluctance that he quitted Whitehall and retired into private life. After the Restoration he lived for a time abroad under a feigned name; but he returned to England about 1680, and passed the remainder of his life at Cheshunt, where he died July 12, 1712, and was buried in the church at Hursley, Hampshire.

CROMWELL, THOMAS, EARL OF ESSEX, chief minister to Henry VIII.; born about 1490. He was the son of a blacksmith, appears to have served in the Italian wars for a time, and on his return to England entered the service of Cardinal Wolsey, won his esteem, and was faithful to him in his disgrace. He then entered the king's service, and obtained, with his favor, many of the highest offices of state. He was privy-councillor, principal secretary of state, and, about 1536, vicar-general, and vice-regent in all matters of religion. Cromwell was the friend of Cranmer, and contributed by various measures to the establishment of the reformed doctrines and worship. In 1539 he was created Earl of Essex, but he soon lost the favor of the king. In 1540 he was imprisoned, attainted on charges of treason, heresy, and extortion, was not allowed to make any defense, and was executed on Tower Hill, July 28, 1540.

CRONJE, PIET (krōn'yë), a Boer military commander; born near Pretoria in 1835. He has been prominent in all the history of the South African Republic. Bred to farm life, he entered politics, refused office under British annexation in 1877, commanded a brigade in the war of 1880-1881, became a member of the Transvaal executive government, and captured Sir John Willoughby and his force after the Jameson raid in 1896. During the war with England in 1899-1900, Cronje rose to the military leadership of the Boers, and held out

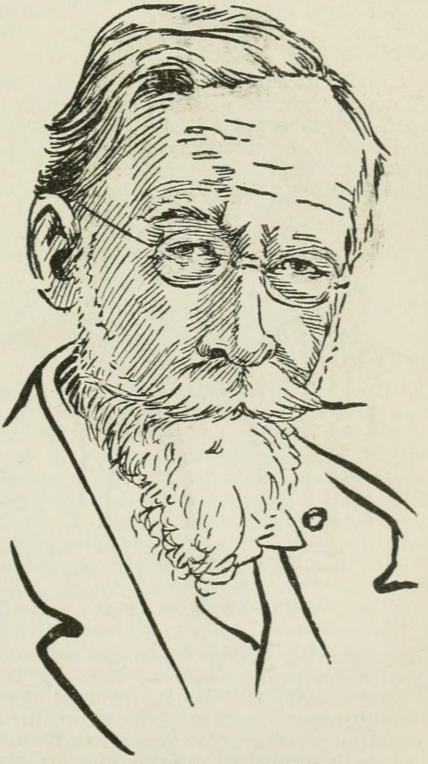
heroically with an inferior force till forced to surrender to Lord Roberts at Klip River, near Paardeberg, Orange Free State. He was exiled to St. Helena in May, 1900. He visited the United States in 1905. He died in 1911.

CRONKHITE, ADELBERT, an American soldier, born in New York City in 1861. He graduated from the United States Military Academy in 1882 and from the Artillery School in 1886, rose through the various grades, and became a colonel in the Coast Artillery Corps in 1911 and brigadier-general in 1917. On April 5 of that year he was appointed major-general. He served in the operations against the Indians in 1891 and in Cuba and the Philippines in 1898. He was commander of the coast defenses of eastern New York from 1911 to 1914 and of the coast defenses of Panama and the Panama Canal Department from 1914 to 1917. From September, 1917, to May 28, 1919, he was commander of the 80th Division of the National Army. He saw service on the western front at St. Mihiel and in the Meuse-Argonne. He held the rank of major-general during this period.

CRONSTADT or **KRONSTADT**, a maritime fortress of Russia, about 20 miles W. of Petrograd, in the narrowest part of the gulf of Finland, opposite to the mouth of the Neva, on a long, narrow, rocky island, forming, both by its position and the strength of its fortifications, the bulwark of the capital, and being also the most important naval station of the empire. It was founded by Peter the Great in 1710, and has spacious regular streets with many handsome houses and churches, very large marine establishments, a naval arsenal, a cannon-foundry, building yard, docks, etc. The harbor consists of three separate basins—a merchant haven, capable of containing 1,000 ships; a central haven for the repair of ships of war; and the war haven, all of which are defended by strong fortifications. Cronstadt used to be the commercial port of Petrograd. It was here in 1917 that the revolt of the Russian fleet began. A Committee of Workers and Soldiers Delegates assumed power in June of that year, defying the provisional government at Petrograd. Preparations to crush the revolt ceased with the fall of Kerensky. Cronstadt then became a naval base for the Soviet government.

CROOK, GEORGE, an American military officer; born near Dayton, O., Sept. 8, 1828. He was graduated at the United States Military Academy in 1852, and rose to the rank of Major-General. In the Civil War he greatly distinguished himself at South Mountain, Antietam, Chickamauga, and Appomattox. After the war he achieved celebrity in campaigns against the Indians as commander of the districts of Idaho and Arizona. From 1888 until his death, he commanded the Military Division of the Missouri. He died in Chicago, March 1, 1890.

CROOKES, SIR WILLIAM, an English physicist and chemist; born in London in 1832; studied at the Royal College of Chemistry under Hofmann, and after 1851 devoted himself to original researches in science. He invented the radiometer in 1875, and the otheoscope in 1877, and announced in 1879 his discovery of the fourth or ultra-gaseous state of matter. In 1880 the French Académie des Sciences bestowed on him an extraordinary prize of 3,000 francs and a gold medal in recognition of his discoveries in molecular physics and radiant matter. In 1881 he acted as juror at the International Exhibition of Electricity in Paris. In this official position he was not entitled to a medal, but in the official report his fellow jurors, after discussing the merits of four systems of incandescent lamps, declared—"None of



SIR WILLIAM CROOKES

them would have succeeded had it not been for these extreme vacua which Mr. Crookes has taught us to manage." It is stated that he was the first to apply photography to the investigation of the solar spectrum. He is the author of "Select Methods in Chemical Analysis," "Manufacture of Beet-root Sugar in England," "Handbook of Dyeing and Calico-Printing," "Manual of Dyeing and Tissue-Printing," etc. He is also joint author of the English adaptation of Kerl's "Treatise on Metallurgy." He has edited the last three editions of Mitchell's "Manual of Practical Assaying," and has translated into English and edited Reimann's "Aniline and its Derivatives," Wagner's "Chemical Technology," Auerbach's "Anthracen and its Derivatives," and Ville's "Artificial Manures." He is an authority on sanitary questions, especially the disposal of town-sewage. In 1907 he shared the Nobel prize for Chemistry with E. Buchner, and in 1910 was awarded the Order of Merit. He died on April 4, 1919.

CROQUET, to the most scientific form of which the name ROQUE is given, is an open-air game played with balls, mallets, and arches, either upon a closely mowed lawn or a specially prepared court. The game is substantially a revival of the old game of Pall Mall, which gave its name to the well known London street. France introduced this game into Ireland and then into England early in the 17th century, and during the 18th century it was largely neglected, but came again into favor about 1850 and was later superseded in popularity by tennis.

CROSBY, ERNEST HOWARD, American author; born at New York, Nov. 4, 1856; son of Howard Crosby. He was educated at the University of New York, and practiced law in New York from 1878-1889. He was appointed by President Harrison in 1889 Judge of the International Court at Alexandria, Egypt, where he remained till 1894. On his return he visited Count Tolstoy, and adopted that writer's ideas in regard to social reform. He was the first President of the Social Reform Club, and Chairman of the New York Friends of Russian Freedom. He published: "Plain Talk in Psalm and Parable" (1899); "Captain Jinks, Hero" (1902); "Swords and Ploughshares" (1902); "Tolstoy and his Message"; and "William Lloyd Garrison" (1905). He died in 1906.

CROSIER, the pastoral staff of an archbishop, surmounted by a cross; or of a bishop or abbot, terminating in a curve or crook. It is generally elaborately carved and ornamented with jewels, etc.

CROSMAN, HENRIETTA, an American actress. Born in West Virginia in 1870, she first went on the stage when nineteen years of age, playing in Campbell's "White Slave." From 1892-1894 she was Charles Frohman's leading lady. In 1900 she began her career as a star in a play entitled "One of Our Girls." In the same year she brought out "Mistress Nell" at the Bijou Theatre in New York. In 1911 she took the rôle of Jess Loraine in the play "The Real Thing," playing later many other important rôles in New York and in other parts of the United States.

CROSS, a gibbet, consisting of two pieces of timber placed across each other in a variety of forms. The cross was used as a very general instrument of punishment from the earliest times. Among the Syrians, Jews, Egyptians, Persians, and especially the Carthaginians, it appears to have been the usual military punishment; but in no part of the ancient world was this punishment so generally resorted to as in the Roman empire, where it was regarded as the most infamous of deaths, and, except in cases of sedition, was inflicted only on slaves or the vilest malefactors. By the Jewish law, it was ordained that the body of the culprit should be removed from the cross on the day of his execution; but the Romans frequently allowed it to hang till it dropped piecemeal to the ground.

By the death of Christ, the cross, from being an object of horror, became the symbol of the Christian world, and, from respect for this symbol, Constantine abolished the punishment of crucifixion throughout the Roman world. The cross is still regarded with the utmost veneration by the Roman Catholic Church, in which certain festivals are observed in memory of circumstances connected with the cross.

The cross on which our Lord suffered is commonly considered to have been the *crux capitata* or Latin cross, but the cross with equal limbs (+) or Greek cross, has been the model followed in the architecture of Eastern churches. The large cross over the entrance to the chancel of a church was called the Rood or Holy Rood. Monumental crosses were and are still often raised in Catholic countries, to mark a boundary, the entrance of a sanctuary, or as record of some event.

CROSS, MARY ANN EVANS. See ELIOT, GEORGE.

CROSS, WILBUR LUCIUS, an American educator and editor, born in Mansfield, Conn., in 1862. He graduated from Yale in 1885 and took post-graduate

studies at that university. In 1902, after having occupied several positions on the faculty of Yale, he became professor of English in the Sheffield Scientific School. In 1916 he was appointed dean of the Graduate School at Yale. He was editor of the "Yale Review" and in 1903 was lecturer at Columbia. He was a member of the National Institute of Arts and Letters. His writings include "Development of the English Novel" 1899); and "History of Henry Fielding" (1918). He also edited the works of many English writers, contributed articles on literature to several encyclopædias, and was a well-known contributor to magazines.

CROTHERS, SAMUEL McCHORD, an American clergyman of the Unitarian church and author. Born in Illinois in 1857, he graduated from Princeton in 1874 and received his theological education at Union Theological Seminary, New York. After serving pastorates in California, Nevada, and Vermont, he became in 1894 pastor of the Unitarian Church in Cambridge, Mass. A few years later he was appointed one of the preachers at Harvard University. His writings are mostly of the familiar essay type and are classics in English style. Most of them were originally written for the "Atlantic Monthly." Among his best known works are "The Pardoner's Wallet" (1905); "The Gentle Reader" (1903); "By the Christmas Fire" (1908); "Among Friends" (1910); "Humanly Speaking" (1912); "Oliver Wendell Holmes and His Fellow Boarders" (1909); "Three Lords of Destiny" (1913).

CROTON, a genus of *Euphorbiaceæ* the typical one of the tribe *Crotoneæ*. Some are trees, others bushes, and yet others herbaceous plants; the leaves and inflorescence are also variable. They occur in the warmer parts of both hemispheres. Some are purgative. A decoction of *C. perdicipes* is used in Brazil as a cure for syphilis and as a diuretic. The purgative root of *C. campestris*, and the leaves and bark of *C. origanifolius*, are diaphoretic and antispastic. The wood of *C. Tiglium* is sudorific, and used against syphilis; the seeds are purgative. The oil of *C. Tiglium* and *Pavana*, two East Indian trees, is so acrid as to blister the skin. They are used as diuretics and purgatives. Many are balsamic. *C. balsamifer* is used in Martinique in the preparation of the liquid called eau de mantes. Frankincense is extracted from *C. thurifer* and *C. adipatus*, which grow on the Amazon. *C. humilis*, found in the West Indies, has aromatic qualities, and is used in medicating baths. *C. gratissimus* is fragrant, and is used as a perfume by the Koras in south Africa. The balsam of *C. origanifolius* is employed as a substitute for copaiva. *C. cascarilla* is aromatic. Yet others have a coloring matter. *C. Draco* and *C. sanguiferum* furnish a red substance like gum-lac. *C. cascarilla*, a Jamaica bush, was thought to furnish the cascarilla of commerce, which is now known to be derived from *C. Eleuteria*, a Bahama shrub; that of Mexico comes from *C. pseudo-China;* and *C. nitens, C. cascarilloides, micans*, and *suberosus* might also be made to yield cascarilla.

CROTON, a river in New York which joins the Hudson, 32 miles N. of New York City. It supplies the city with water through the Croton Aqueduct, which was first opened in 1842. A new aqueduct was completed in 1906.

CROTON AQUEDUCT, the aqueduct which carries a portion of the water supply of New York City from the Croton basin, an area of about 375 square miles, situated about 30 miles from the city. The old aqueduct was constructed between 1837 and 1842; it is 38 miles long, with a declivity for the greater part of its course of 13½ inches to the mile, the water channel averaging 8 feet 5 inches in height and 7 feet 8 inches in greatest breadth. New York needs demanding a greater supply, a new aqueduct was begun in 1883. This delivers to the city about 336,000,000 gallons daily. With the completion of the Catskill aqueduct in 1917 the Croton aqueduct furnishes only about half the water supply of New York City.

CROUP, a term used in Scotland from an early period to describe a certain train of laryngeal symptoms, was first applied by Dr. Francis Home, in 1765, to an acute inflammatory and non-contagious affection of the larynx, in which there is the formation of a false membrane or fibrinous deposit on the mucous surface of the windpipe. The invasion of the disease resembles that of simple catarrh, and may be very insidious. If the patient is not relieved by coughing or vomiting up some membranous shreds and glairy mucus, a state of greater dyspnœa ensues. A period of extreme restlessness and suffering is (unless relieved by immediate treatment) soon followed by death from increasing coma, syncope, or exhaustion.

Croup seems to be caused by a damp atmosphere of low temperature, especially in exposed situations. It is most frequently met with between the years of two and ten, though all ages are liable to suffer from it. It is commoner in boys than girls.

CROW, the crow family (*Corvidæ*), order *Insessores*, comprises birds that have a strong bill, compressed toward the points, and covered at the base with stiff, bristly feathers, which advance so far as to conceal the nostrils. The plumage is dense, soft, and lustrous, generally dark, but sometimes of gay colors. They are very omnivorous, and remarkable for their intelligence. The family, widely diffused over the world, includes the common crow, type of the *Corvidæ*, and the above, which will be described here; and the raven, the fish-crow, the rook, the jay, and the magpie. The common crow of North America, *Corvus Americanus* (Audubon), is about 20 inches long, and the wings about 13 inches. It is remarkable for its gregarious and predatory habits. The bill is straight, convex, and compressed. The nostrils are placed at the base of the bill, and are pantalous; the tongue short, and bifid at the tip; the toes are separated almost to the base, and the middle one is the longest.

CROW-BLACKBIRD, the name of certain American birds of the genus *Quiscălus*, family *Sturnidæ* or starlings. The great crow-blackbird, *Q. major*, found in the Southern States, Mexico, and the West Indies, is 16 inches long, and of a glossy black plumage. The female is of a light brown above and whitish beneath. The purple grackle, lesser or common crow-blackbird, *Q. versicŏlor*, is similar in color to the preceding, but smaller. They reach the Middle States of the United States from the S. in flocks in the latter part of March, and build in April in the tall pines or cedars. In their first arrival they feed upon insects, but afterward commit great ravages upon the young corn. In November they fly S. again.

CROWDER, ENOCH HERBERT, an American soldier, born in Missouri in 1859. He graduated from the United States Military Academy in 1881 and was commissioned 2d lieutenant of the 8th Cavalry in the same year. He became major and judge-advocate in 1895 and lieutenant-colonel and judge-advocate of volunteers in 1898. He was honorably discharged from volunteer service in 1901 and was made lieutenant-colonel and judge-advocate of the United States Army. He was promoted to be colonel and judge-advocate-general in 1903; brigadier-general and judge-advocate-general in 1911; and major-general and judge-advocate-general in 1917. He saw service in the Philippine Islands; in Manchuria with the Japanese Army; and in Cuba, where he was Secretary of State and of Justice from 1906 to 1908. From May, 1917, to July, 1919, he was provost-marshal-general of the United States Army. In this capacity he had general charge of the carrying out of the draft laws and in this work performed distinguished service. In March, 1919, he acted as advisor to the Cuban Government on the subject of changes in the election legislation. He was awarded the Distinguished Service Medal "for especially meritorious and conspicious service" as provost-marshal-general during the war.

CROWE, EYRE, an English historical and genre painter; born in London, in October, 1824; studied painting in the atelier of Paul Delaroche in Paris. He went with that artist to Rome in 1844. Acting as amanuensis to William M. Thackeray, he visited the United States in 1852-1853. He was elected an Associate of the Royal Academy in 1876. Among his paintings are "Goldsmith's Mourners" (1863); "Friends" (1871); "French Savants in Egypt" (1875); "The Rehearsal" (1876); "Marat: 13 July, 1793," "The Blind Beggar," and "The Queen of the May," in 1879; "Queen Eleanor's Tomb" and "Forfeits," in 1880; and "Sir Roger de Coverley and the Spectator at Westminster Abbey" (1881); "'How Happy Could I be with Either!" and "The Defense of London in 1643" (1882); "Old Porch, Evesham," in 1884, etc. He wrote "With Thackeray in America" (1893); "Haunts and Homes of Thackeray" (1897). He died in 1910.

CROWFOOT, a troublesome weed found in gardens and pastures. Many varieties, such as the spearwort, abound in moist places, bearing white flowers and spreading over ditches and ponds. The weed when eaten by cattle imparts a strong flavor to dairy products.

CROWN, a wreath or garland for the head, given as the reward of victory or of some noble deed. Among the Romans they were of several kinds: *Castrensis*, or *vallaris*, given to the individual who first scaled the rampart in assaulting the camp of an enemy; *muralis*, to him who first mounted the breach in storming a town; *navalis*, to him who first boarded an enemy's ship; *obsidionalis*, given by soldiers who had been beleaguered to the commander by whom they had been relieved; and *civica* (the most honorable of all), bestowed on him who had saved the life of a citizen.

The word is also applied to the ornament of the head, worn as a badge of sovereignty by emperors, kings and princes. Those worn by the nobility are called coronets. That worn by the Pope is more commonly called a tiara. The

monarchical practice of wearing crowns on state occasions is of considerable antiquity. Tarquinius Priscus, 616 B. C. is said to have been the first Roman sovereign who wore one. Constantine, who began to reign in A. D. 306, wore a crown. From him, it is said, the several European kings, from the 4th to the 8th centuries, borrowed the practice.

CROYDON, a municipal and parliamentary borough of England, in County Surrey, 10 miles S. of London, of which it is practically a suburb; near the sources of the Wandle, and near the Banstead Downs. The town, which is a favorite residence of merchants and business men, retired tradesmen, etc., is surrounded by fine villas, mansions, and pleasure-grounds. It is a place of ancient origin, but from its recent rapid increase is almost entirely new. Of special interest are the remains of the ancient palace, long a residence of the archbishops of Canterbury. Pop. (1919) 184,239.

CROZET ISLANDS, a group of four uninhabited islands in the South Indian Ocean, between Kerguelen and Prince Edward Islands. They are all of volcanic origin, and the most easterly of them, East Island, has peaks exceeding 4,000 feet. The largest, Possession Island, is about 20 miles long by 10 broad.

CROZIER, WILLIAM, an American military officer, born in Ohio, Feb. 19, 1855, and graduated from West Point in 1876. After rising to the rank of major in the regular army he was offered a professorship in the West Point Academy, but declined the appointment to become brigadier-general, chief of ordnance, in 1901. In July, 1918 he was made a major-general and retired from active service at the close of that year. General Crozier served in several campaigns against the Indians and was with General Buffington, the inventor of the disappearing gun carriage. In addition to his regular duties as an army officer he was military adviser to the American delegation to the Hague Conference and President of the Army War College during 1901 and 1902.

CRUCIBLE, a melting of earthenware, porcelain, or of refractory metal, or of plumbago, adapted to withstand high temperatures, without sensibly softening, to stand sudden and great alterations of temperature without cracking, to resist the corrosive action of the substance fused in them and the action of the fuel. They are mentioned by the Greek authors, are shown in the ancient Egyptian paintings, and were made by the old alchemists for their own use. Metallic crucibles are of platinum, silver, or iron.

CRUCIFERÆ, an order of hypogynous exogens, alliance *cistales*.

CRUELTY TO ANIMALS, PREVENTION OF. In the common law animals were considered merely as property and cruelty to them was punishable only when it became a nuisance. The general humanitarian movement in England which took many phases tending to remedy abuses did not fail to make the attempt here. In 1824 a society was organized and after some years secured the passage of a statute fining anyone who "shall cruelly beat, ill-treat, overdrive, abuse, or torture" animals mentioned in the statute. Henry Bergh was the leader in securing similar acts of the State legislatures in the United States, and before the end of the century nearly all the States had made cruelty to animals a punishable offense. One of the most effective societies for the prevention of cruelty to animals is that of Pennsylvania. Its aim is the education of the owners of animals rather than by threatening them with the law. It has agitated to secure the use of proper harness, the abolition of the check rein, and the discontinuance of the practice of docking horses' tails. In 1874 they provided the first ambulance for the removal of disabled animals and devised a derrick for hoisting them out of holes. Some States have societies providing homes for stray cats and dogs and places where they can be put to death without pain. King Edward VII., when Prince of Wales, was much interested in the movement to prevent cruelty to horses and his precept and example greatly aided the work of the societies in England.

CRUELTY TO CHILDREN, PREVENTION OF. The influence of the Roman law in conferring such absolute power over children in the parents operated to restrain any attempts to interfere on the part of outsiders. It was not until 1875 that the first Society for the Prevention of Cruelty to Children, that of New York, was founded. By 1920 societies having for their object the prevention of cruelty to children numbered more than 350. Their work is to discover cases of cruelty and present the facts to the courts for action. The main object of the societies is to see that the acts passed by the legislature are enforced, and in this respect also they perform an invaluable service. In general the societies are maintained by private subscriptions, but in some States, such as Colorado, the State makes a semi-annual appropriation, and in 1901 the Legislature of that State made the society the

"State Bureau of Child and Animal Protection."

CRUIKSHANK, GEORGE, an English pictorial satirist; born in London, Sept. 27, 1792. A publication, "The Scourge" (1811-1816), afforded scope for the display of his satiric genius, and from that time forth he continued to pursue with remarkable success this his true vein. His illustrations for Hone's political squibs and pamphlets, and especially those dealing with the Queen Caroline trial, attracted much attention; but in the exquisite series of colored etchings contributed to the "Humorist" (1819-1821), and in the etchings to the "Points of Humour" (1823-1824), did his true artistic power begin to be visible. This second, and in many ways finest, period of his art, represented by these works, culminated in the etchings to "Peter Schlemihl" (1823), and to Grimm's "German Popular Stories" (1824-1826). His numerous plates in "Bentley's Miscellany" mark a third period of his art, in which he aimed at greater elaboration and completeness. The finest of these are the series to Dickens' "Oliver Twist," to Ainsworth's "Jack Sheppard," and in "The Tower of London" and "Windsor Castle." As a water-colorist he left work marked by considerable skill and delicacy. In his late years he devoted himself to oil-painting. His most important picture was "Worship of Bacchus" (1862). He died Feb. 1, 1878.

CRUISER, one who cruises about; specifically, an armed vessel which cruises about, either to protect the commerce of its own country or to inflict damage on that of another. The cruiser rates just below the battleship and just above the gunboat. An armored cruiser has side or vertical armor and horizontal or deck armor. A protected cruiser has horizontal or deck armor only. An unprotected cruiser has no armor. See NAVY.

CRUSADE, a military expedition under the banner of the cross, as that against the infidels of the Holy Land; also any war or expedition undertaken on pretense of defending the cause of religion; a romantic or enthusiastic enterprise; as, a crusade against vice. In the European history of the Middle Ages, crusades were wars undertaken by confederacies of chiefs and soldiers, with a religious object. Those which were engaged in by a great part of the nations of Europe for the recovery of Palestine from the infidels, are now frequently denoted by this peculiar name. The term crusade is derived from the sacred symbol of the cross, which was borne by the warriors engaged in it over their arms; the color of the cross often served to designate the nation of the soldier; as the white cross on a red ground, France; the red cross on a white ground, England.

The principal crusades for the conquest of Palestine were: 1. The first, A. D. 1096, excited by the preaching of Peter the Hermit and the encouragement of Pope Urban II., in which Godfrey of Bouillon headed the Christians, who made themselves masters of Jerusalem and a great part of Palestine. 2. The second, A. D. 1142, in which Conrad III. of Germany and Louis VII. of France led armies to complete the conquest of Palestine, but without success. 3. The third, A. D. 1189, was occasioned by the capture of Jerusalem by Sultan Saladin; Frederick (Barbarossa) of Germany, Philip Augustus of France, and Richard Cœur de Lion of England, were the chief among the confederate monarchs; the capture of Acre was almost the only fruit of this great expedition. 4. The fourth crusade was conducted by the King of Hungary, Andrew II., in 1217. 5. The fifth (1228) was conducted by Frederick II. (grandson of Barbarossa), who recovered Jerusalem, but for a short time. 6. The sixth, A. D. 1248, by Saint Louis, King of France, against Egypt, but without success.

Among other wars which have been at various times denoted by the name of crusade, that against Raymond, Count of Toulouse, and his heretical vassals, the Albigeois, of which the first leader was the famous Simon de Montfort, is the most memorable.

CRUSTACEANS, a class of articulated animals, agreeing with insects, arachnida, and myriopoda, in having articulated limbs, but differing from them in important respects, and particularly from all of them in the adaptation of the organs of respiration to an aquatic life, even those of them which live on land being generally inhabitants of damp places, and breathing by a kind of gills. Some of the lowest and minute aquatic crustaceans, indeed, are not provided with gills; but with the aeration of the blood is supposed to take place through the surface of the body. The crustaceans derive their name from the hard armor which in most of them covers their whole body.

CRYOLITE, a mineral composed of aluminum, sodium, and fluorine. It is found in large quantities in Greenland. The name, which signifies ice or frost stone, was given it by Abildgaard, who discovered it in 1800. It also occurs in the Ural Mountains, but not abundantly. The mines at Ivigtut, Greenland, have

been worked since 1857, and are apparently inexhaustible. None of the finest specimens, however, reach the United States, as the mines are owned by the Danish government and the best of their product is taken to Copenhagen. Among the resulting products are soap, baking soda, washing soda, aluminum sulphate, and a kind of glass which resembles porcelain.

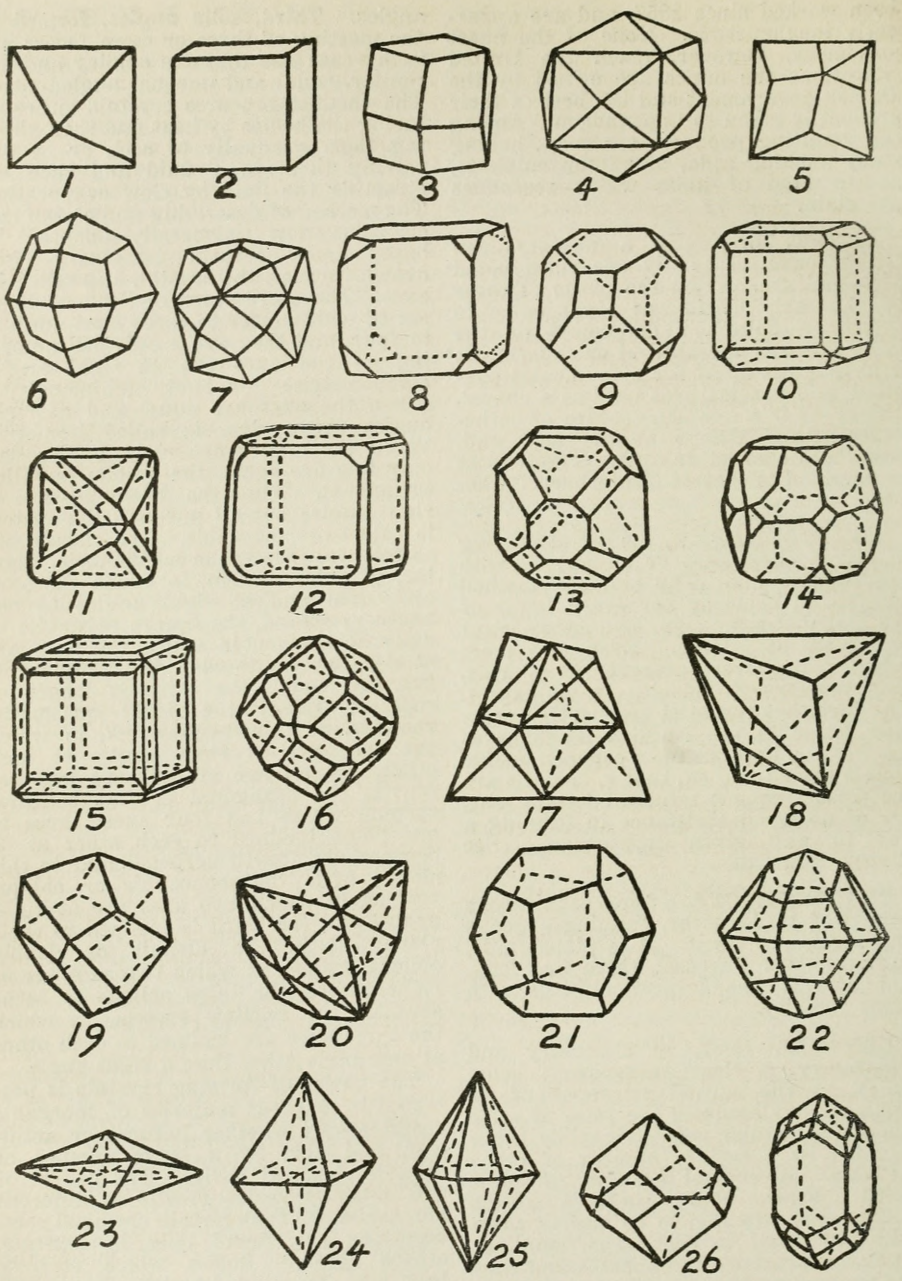
CRYPT, originally a subterranean cell or cave, especially one constructed for sepulture. From the usage of these by the early Christians crypt came to signify a church underground or the lower story of a cathedral or church. It is usually set apart for monumental purposes, and is sometimes used as a chapel. The crypt is a common feature of cathedrals, being always at the east end, under the chancel or apse. The largest in England is that of Canterbury Cathedral.

CRYPTOGRAPHY, the art of writing in secret characters or cipher, or with sympathetic ink. The simplest method consists in choosing for every letter of the alphabet some sign, or another letter or group of letters. Even the more complex, however, present, as a rule, only temporary difficulty to an expert. The fact that the most frequently recurring letter in the English language is the letter *e*, that the most common double vowels are *ea* and *ou*, that *r*, *s*, and *t* are the most frequent terminal letters, etc., are of no small assistance in forming a key to any given cryptogram. See CIPHER WRITING.

CRYPTOPROCTA, a fierce carnivorous animal of Madagascar, forming a genus and species by itself. It is plantigrade, but resembles a weasel, three feet long, and attacks the largest animals with great ferocity.

CRYSTAL (ice), in chemistry and mineralogy, a clear transparent body, which, by the mutual attraction of its particles, has assumed the form of some one of the regular geometric solids, being bounded by a certain number of plane surfaces. A crystal consists of three parts. First, plane surfaces, called faces, which are said to be similar when they are equal to each other and are similarly situated; dissimilar, when they are unequal or have a different position. Second, edges, formed by the meeting of two faces. They are said to be similar when formed by similar faces; dissimilar, by dissimilar faces. Equal edges are formed when the faces are inclined at the same angle to one another; unequal, when they are inclined at different angles. Third, solid angles, formed by the meeting of three or more faces; and in this case also they are similar and dissimilar, equal and unequal angled edges. The chemist procures crystals either by fusing the bodies by heat and then allowing them gradually to cool, or by dissolving them in a fluid and then abstracting the fluid by slow evaporation. The method of describing and classifying crystals (now universally adopted) is based upon certain imaginary lines drawn through the crystal, and called its axes. There are seven of these systems, six of which refer to three axes and one to four, and they are subdivided according as the axes are at right angles (orchometric) or not (chinometric). When the axes are equal and at right angles the system is called isometric. When the angles are right angles, but only two are equal, the system is called tetragonal. When the three axes are at right angles but all unequal, the system is called orthorhombic. The classes are as follows: First, the monometric, regular, or cubic system, in which the axes are equal and at right angles to one another; second, the square prismatic or dimetric system, in which the axes are at right angles to each other, and while two are equal, the third is longer or shorter; third, the right prismatic, rhombic, or trimetric system, in which the axes are at right angles to each other, but all are of different lengths; fourth, the hexagonal or rhombohedral system, which has four axes, three in one plane inclined to each other at 60 degrees, the fourth perpendicular to this plane; fifth, the monoclinic or oblique system, in which two axes are at right angles and the third is inclined to their plane; sixth, the diclinic or doubly oblique system, in which two axes are at right angles, the third oblique to both; seventh, the triclinic system, in which the three axes are inclined to each other at any angle other than a right angle.

The power of forming crystals is possessed by a great majority of inorganic combinations whether natural or artificial, and also by a large number of organic chemical bodies. The degree of this capacity varies greatly in different substances, so that certain chemical combinations are found only in crystals, others rarely. Bodies which entirely lack the power of forming crystals or crystalline aggregates are called amorphic. The size of crystals also varies greatly. Some are very large, others are only aggregations of microscopic crystals. The infinitesimally small crystals are called microliths. Crystals grow by the deposit of new horizontal layers



CRYSTALS

No. 1, Octahedron; No. 2, Hexahedron; No. 3, Rhombic Dodekahedron; No. 4, Tetra-Hexahedron; No. 5, Triakisicosahedron; No. 6, Icositetrahedron; No. 7, Hexoctahedron; Nos. 8 and 9, Combination of Hexa and Octahedron; No. 10, Combination of Hexahedron and Dodekahedron; No. 11, Combination of Octahedron and Dodekahedron; Nos. 12, 13, 14, 15 and 16, Various combinations of regular systems; No. 17, Derivation of Tetrahedron from an Octahedron; No. 18, Trigonal Dodekahedron; No. 19, Deltahedron; No. 20, Hexakisoctahedron or Hexoctahedron; No. 21, Pentagonal Dodekahedron; No. 22, Dyakisdodekahedron or Diploid; No. 23, Tetragonal Protopyramid; No. 24, Tetragonal Deuteropyramid; No. 25, Ditetragonal Pyramid; No. 26. Tetragonal combinations.

on their surfaces, always keeping the characteristic angles exactly the same. Even when the growth of crystals in different directions takes place, with unequal rapidity, and distorted forms arise, as is often the case, the law still holds good, the inclination of the adjacent planes and the angles which they enclose are the same. Hence the importance and the value of crystallometry and the science of crystallography or crystalology. Crystals occur with an almost infinite variety of forms—calcareous spar having alone more than 200 forms in more than a thousand different combinations, and some crystals have as many as 300 different sides. But all crystals may be grouped in accordance with certain systems.

CRYSTALLINE ROCKS, a name given to all rocks having a crystalline structure. The crystalline texture may either be original or superinduced. Thus some crystalline rocks, such as certain calcareous masses, owe their origin to chemical precipitation from water, while others again, such as lavas, have consolidated from a state of igneous fusion. There is another large class of crystalline rocks, the crystalline granules of which present a remarkable foliated character—that is, they are arranged in more or less parallel layers. This peculiar schistose structure appears to have been superinduced—the original rocks having been either fragmental or crystalline or both—and the result of great heat and pressure. Such highly altered rocks occur in the neighborhood of masses of granite, and cover wide regions, where there is abundant evidence to show that the strata have been subjected to enormous compression. It is therefore believed that pressure and the heat engendered by great earth-movements, and the intrusion of plutonic igneous matter, are among the most potent agencies in the production of schistose structure.

CRYSTALLITES, minute non-polarizing bodies (the result of incipient crystallization) occurring in the vitreous portions of igneous rocks.

CRYSTALLOGRAPHY, the science which describes or delineates the form of crystals. In A. D. 1672, Romé de Lisle published his "Essay on Crystallography," but the honor of being regarded as the founder of the science is given to the Abbé René-Just Haüy. He was born at St. Just, in what is now called the department of Oise, and, among other works, published his "Essay on the Structure of Crystals," in 1784, as also his "Treatise on Mineralogy" and his "Treatise on Crystallography," both in 1822—the year of his death. His view was that all the varieties of crystals which a particular mineral may assume are derivable from one simple form, which is the type of the mineral. That form he attempted to ascertain in each individual case. Essentially the same view is still held. Imaginary lines may be supposed to be drawn through a simple crystal longitudinally from end to end, transversely from side to side, or in either of those ways, or obliquely from angle to angle, around which imaginary lines all the particles of matter composing the crystal may be supposed to arrange themselves. Such imaginary lines are called the axes of the crystal. If skillfully chosen they become somewhat more than imaginary lines, for they may coincide with the optical axes of the crystal if it possess double refraction. According to the number, relative length, position, and inclination to each other of these lines depends the outward form of the crystal.

Dana enumerates the following "systems of crystallization":

(1) Having the axes equal—the Isometric system.

(2) Having only the lateral axes equal — the Tetragonal and Hexagonal systems.

(3) Having the axes unequal — the orthorhombic, monoclinic, and triclinic systems. See CRYSTAL.

CTENOPHORA, an order of *Actinozoa*, consisting of marine animals which swim by means of ctenophores. The body, which is gelatinous and transparent, is generally more or less oval in form. Most of the species have a pair of very extensible filiform tentacles. There are two tribes, *eurystomata* and *stenostomata*, the first containing the family *beroidæ*, and the second the families *saccatæ*, *lobatæ*, and *tæniatæ*. The ctenophora are found in all seas.

CTESIAS, a Greek historian of about 400 B. C., contemporary with Xenophon and partly with Herodotus. He was a physician, and lived for 17 years at the court of Persia. He wrote a "History of Persia," of which little remains.

CTESIPHON, a city of Babylonia, on the E. bank of the Tigris and opposite Seleucia, the common winter residence of the Parthian kings, and finally the capital of the Parthian kingdom. It was conquered by the Romans in A. D. 115, and destroyed by the Arabs under Omar in 637. Its ruins still attest its former magnificence.

CTESIPHON, BATTLE OF, an important military engagement, fought on Nov. 22, 1915, between Turkish forces

under Nuredin Pasha and the British expedition, under General Townshend, which advanced from Amara, in Septembre, 1915, along the Tigris, with the object of capturing Bagdad. At no time did the British force amount to more than four brigades, two-thirds of which were composed of East Indians, while the Turks consisted of at least four divisions, with a strong preponderance in artillery. Ctesiphon, renowned in times of antiquity, was at this time only a large village on the Tigris, 18 miles below Bagdad. Close by stand the ruins of the ancient palace built by the Persian emperors, containing the greatest vaulted room in the world. Here the armies of the Prophet had also achieved one of their greatest victories, and it was because of this historic significance to the followers of Mohammed that the Turkish commander decided to make a determined stand at this point. As a military engagement, however, the encounter between the two armies was a victory for the British, an entire Turkish division being destroyed and 1,600 prisoners taken. But the success was dearly paid for; the British lost 643 in killed, 3,330 in wounded and over 500 not accounted for, out of a total of only 25,000 men. In spite of their success, the British were compelled to retire to Kut-el-Amara, where they were besieged and finally captured by the Turks.

CUANDO, a name of the Chobe, a tributary of the Zambesi.

CUBA, the largest and most westerly of the West Indies. It stretches in the form of a narrow crescent, convex on the N. side, at the entrance of the Gulf of Mexico, which it divides into two channels, the N. W., 124 miles wide, and the S. W., 97½ miles at its narrowest part.

Topography.—Cuba is 775 miles long from Cape Maysi on the E. to Cape Antonio on the W., with a breadth varying from 30 miles to 160 miles, a coast-line of 1,976 miles, and an area of 44,215 square miles. Only about one-third of the coast-line is accessible to vessels, the remainder being beset by reefs and banks. The shores, low and flat, are liable to inundations, but there are numerous excellent havens. A watershed running lengthwise through the island, rises into mountainous heights only in the S. E., where are the Sierra de Maestra, shooting up in the Pico de Tarquinto to 8,400 feet, and the Sierra del Cobre (copper). The mountains, composed of granite overlaid with calcareous rocks, and containing minerals, especially copper and iron, are clothed in almost perennial verdure, wooded to the summits. Carboniferous strata appear in the W., schistose rocks on the N. coast. The limestone rocks abound in caverns, with magnificent stalactites. Mineral waters are plentiful. The rivers running N. and S., are navigable for only a few miles by small boats, but are very serviceable for irrigation of the plantations, and supply excellent drinking water. The climate, more temperate than in the other West Indian islands, is salubrious in the elevated interior, but the coasts are the haunt of fever and ague. No month of the year is free from rain, the greatest rainfall being in May, June, and July. Earthquakes are frequent in the E. Hurricanes, less frequent than in Jamaica, sometimes cause widespread desolation. A hurricane in 1846 demolished 1,872 houses and sank 216 vessels, and another in 1870 caused the loss of 2,000 lives.

Soil, Productions, Etc.—The soil of Cuba is a marvel of richness, and a large part is still covered with virgin forest containing magnificent mahogany, cedar, ebony, logwood, lignum-vitæ, pine and caiguaran. The vegetation of Cuba also includes tamarind, palms, ferns, lianas, etc. Among the cultivated products are sugar, tobacco, coffee, cacao, rice, maize, cotton, esculent roots and tropical fruits. Among the animals are a species of tailless rat peculiar to Cuba, a great abundance of birds, including the mocking-bird, a species of vulture (valuable as a scavenger), woodpecker, partridge, flamingo, and albatross. Of noxious animals and insects there are the crocodile, scorpion, and mosquitoes. The rivers and seas are well stocked with fish, the turtle abounding in the shallows and sandy places of the beach. The chief crops of the country are sugar and tobacco. The abnormal demand for sugar during the World War, especially from the date of the entrance of the United States into it, produced conditions in Cuba which resulted in great prosperity among the sugar planters and, in fact, throughout all classes on the island. The sugar crop in 1918 was 4,048,480 tons, and in 1919, 4,446,229 tons. The total area planted to sugar was nearly 1,400,000 acres, and there were over 200 sugar mills in operation. The vast speculation in sugar in 1919 and 1920 resulted in financial conditions which made it necessary to take stringent measures to prevent complete collapse of the banking system. A moratorium was declared which lasted for the greater part of 1920 and into 1921. The value of the tobacco manufactured in 1918 was $13,829,627. Other important productions were rum, alcohol, live stock, lum-

ber. Rich mineral resources, especially in the province of Oriente, iron, copper, zinc, lead, gold, and petroleum, are found there in abundance. In other districts in the island there were also valuable mineral deposits. In 1919 there were about 4,000 workmen employed in the iron mines. Iron was exported to the United States averaging 50,000 tons a month. In 1918-1919 the sugar crop was 4,446,220 tons.

Commerce.—The total imports in 1919 were $315,587,167, and the exports, $447,221,963. The exports in the order of their importance were sugar, unmanufactured tobacco, iron, gold, copper ores, manufactured tobacco, molasses, hides and skins. The total imports from the United States in the fiscal year 1920 amounted to $396,565,049. The total exports to the United States amounted to $235,469,608.

Transportation.—There were in 1920 3,200 miles of railway in Cuba. The roads having the longest mileage were the United Railways of Havana, 705; Cuba Railroad, 589; Cuban Central Railroad, 389; and the Western Railroad of Havana, 147. All the important towns and seaports are connected by rail. Many large sugar estates have private lines connecting them with the main lines. Nearly 2,500 vessels enter the port of Havana annually. There are about 230 telegraph offices, and 9 wireless stations, operated by the government.

Finance.—The total revenue for 1918-1919 was £12,982,000 and the expenditures amounted to £10,878,973. The principal items of income are customs revenue and the tax on sugar. The chief items of expenditure were war and marine, and instruction. The foreign debt in 1819 amounted to 52,874,500 pesos, and the internal debt to 30,731,900 pesos, or a total debt of 83,606,400 pesos.

Education. — Secondary and higher education is given by the government in accordance with the constitution. Six secondary schools are maintained, one in each of the six provinces. The total number of students in these schools was 2,087. In 1919 there were 334,671 pupils in the public schools and 5,877 teachers. University instruction is given at the University of Havana, which has faculties of liberal arts and science, medicine and pharmacy, and law.

Population, Etc.—The total population, in 1919, was 2,898,905; Havana, 697,583.

Government.—The government of Cuba is that of a republic, under a constitution adopted February 21, 1901. The executive officers include a President and Vice-President, and the legislative branch includes a Senate and a House of Representatives. The first election took place in 1902 and the control of the island was formally transferred to the National Government on May 20 of that year. The cabinet consists of secretaries of State, Justice, War, Marine, Interior, Finance, Agriculture, Commerce, Labor, Public Instruction, Public Works, Sanitation, and Charity. The Senate includes 24 members, four from each province, and the House of Representatives, 114, one for each 25,000 inhabitants.

History. — Cuba, spoken of as the QUEEN OF THE ANTILLES, was discovered by Columbus in 1492, the discoverer calling it "the most beautiful land that eyes ever beheld." It was first settled by Spaniards at Baracoa in 1511. Havana, first settled in 1519, was reduced to ashes by the French in 1538, and again in 1554. For about one and a half centuries Cuba was in constant danger from French, Dutch, English, and West Indian filibusters. In 1762 the English, under Lord Albemarle, took Havana, which, however, was by the treaty of Paris next year restored to Spain. From 1789 to 1845 the island was a vast slave-trading center. Negro insurrections occured in 1845 and 1848. In the latter year the United States offered $100,000,000 to Spain for the island. Rebellions against Spanish rule broke out in 1849 and 1868. They were put down after long campaigns; but in 1895 another insurrection attained by 1898 formidable proportions. The United States battleship "Maine," while on a friendly visit, was blown up in Havana harbor, Feb. 15, 1898, and on April 19, the Congress of the United States adopted resolutions declaring Cuba independent. War with Spain began at once. Cervera's Spanish fleet was destroyed at Santiago de Cuba, July 3, and Santiago and its large army were surrendered on July 17. The leading military events of the war, so far as Cuba was concerned, were the fight at El Caney and San Juan, the battle at Santiago, and the struggle before Las Guasimas. Under the treaty of peace the island was evacuated Jan. 1, 1899, the United States then formally assuming the government, till the Cubans had adopted a written constitution and installed a satisfactory native government.

A Constitutional Convention assembled in Havana in Nov., 1900, when a constitution providing for a republican form of government was adopted. Thereupon the United States Congress authorized the transfer of the government, under certain conditions, which were confirmed in permanent treaty between Cuba

and the United States in May, 1903. The first Congress of the Cuban Government met in Havana, May 5, 1902. Aug. 14, 1902, the Cuban Government authorized a loan of $35,000,000, redeemable in 30 years, the object being to assist sugar-cane growers. A reciprocity treaty with the United States was signed on Dec. 12, 1902.

An insurrection broke out in 1906, which necessitated intervention on the part of the United States. A provisional government was established in August of that year, which continued until January 24, 1909, when the American authorities again evacuated the island, turning the administration over to the newly elected president, Jose Miguel Gomez.

The government prospered under the administration of General Gomez, but in 1911 discontent of the old soldiers who felt that they had not been sufficiently rewarded for their services led to uprisings. There was a threat of further American intervention, but the revolt was quelled by the authorities and order was quickly restored. In 1912 Mario Menocal was elected president. He at once addressed himself for financial and economic reforms, and in 1914 secured a large loan from the United States. President Menocal was re-elected in 1916. Up to the declaration of war by the United States against Germany, Cuba remained neutral, but on April 7, 1917, acting upon the advice of President Menocal, the Cuban Congress declared war against Germany. On the following day the German minister was given his passports. Several Cuban vessels in German waters were seized. War was declared against Austria-Hungary on Dec. 16, 1917. On April 3, 1918, the Cuban Congress passed a law authorizing the creation of an obligatory military service, applying to all male Cubans not expressly exempted, and to remain in force for two years, and for one year after the time of peace. The army was to be composed of 17,000 men in active service. This law was repealed in January, 1919. In 1920, Dr. Alfredo Zayas was nominated for president, by coalition of the Conservaive and Popular parties. He was elected by the returns, but the election was disputed, and it was necessary to hold by-elections in 1921. Gen. Crowder as representative of the United States visited the island in the spring of 1921 in order to supervise the elections and otherwise guard the interests of the United States.

CUBE, in geometry, a solid figure contained by six equal squares, a regular hexahedron. From the simplicity of its form it is the unit for measuring the contents of the other solids. Cubes are to each other as the third power of any of the lines inclosing their sides.

In arithmetic, the third power of a number; a number multiplied by itself, and the product multiplied again by the original number; thus, 125 is the cube of 5, for it is $5 \times 5 \times 5$.

CUBEB, the small spicy berry of the plant or plants described under CUBEBA.

CUBEBA, a genus of hypogenous exogens, order *Piperaceæ*, tribe *Piperidæ*. The flowers are dicecious, invested by sessile bracts; the fruits contracted at the base into what look like pedicels. They are found in Asia and Africa.

CUBISTS, painters, belonging to the group called post-impressionists, who claim to see in the perspective of natural objects a series of cubical forms which they endeavor to depict in their art.

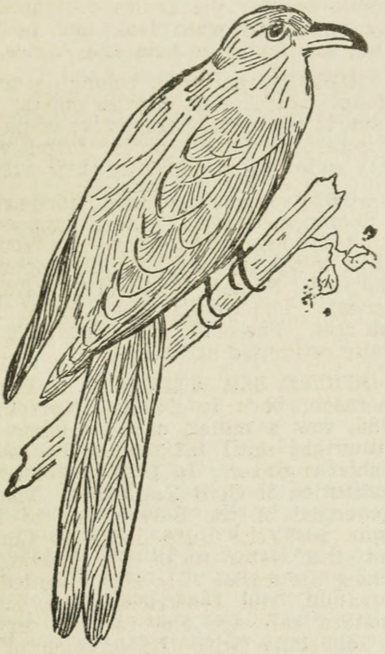
CUBIT (Lat., *cubitus*, "fore-arm"), a Roman measure of length supposed to equal the length of the fore-arm from the elbow to the tip of the middle finger. It was 1½ Roman feet (17½ English inches). The English cubit is 1½ English feet. The cubit of Scripture is generally estimated at 22 inches.

CUBITT, SIR WILLIAM, an English engineer; born in Dilham, Norfolk, in 1785, was a miller, cabinet-maker, and millwright until 1812, when he became a chief-engineer. In 1823 he joined the Institution of Civil Engineers. The improvement of the Severn and of Boulogne port, the Bute docks at Cardiff, and the water-works for Berlin are among his works. He also invented the treadmill, and constructed the South-Eastern railway; and for his services in connection with the erection of the Great Exhibition buildings he was knighted in 1851. He died Oct. 13, 1861.

CUCKOO (*Cuculus canorus*), a well known bird. The head and upper parts are of dark ash, the throat, the under side of the neck and fore part of the breast of a paler ash or brown, the rest of the breast and the belly white, with transverse undulating black lines, the quill feathers with white on their inner webs, the tail ash, white, and black commingled, feet yellow; length, 14 inches. The cuckoo forces foster-parentage on other species of birds.

CUCKOO FLOWER or **LADY'S-SMOCK** (*Cardamina pratensis*), a common and pretty meadow plant, order *Cruciferæ*, with pale lilac or white flowers. *C. pratensis* is abundant in Great Britan and is found in swamps N. of New York.

CUCUMBER (*Cucumis sativus*), an article of food, having yellow unisexual male and female flowers in the axils of the leaf stalks. The leaves are large, the stems weak and trailing. It is a native of the S. of Asia and of Egypt. It is mentioned by Vergil. It is said to have been common in England during the reign of Edward III., A. D. 1327-1377. Having gone out of culture during the Wars of the Roses, it was re-introduced under Henry VIII. from the Netherlands, between 1509 and 1547, probably about 1538.



CUCKOO

CÚCUTA, SAN JOSÉ DE, a town in the Colombian department of Santander, on the Rio Zulia, 35 miles S. of Puerto Villamizar. It is the third commercial town of the republic, a center of coffee and cacao cultivation. It was destroyed by earthquake in 1875, but has been well rebuilt. Pop. about 20,000. ROSARIO DE CÚCUTA, to the S. E., was the seat of the first Colombian congress in 1821, and the birthplace of the patriot, General Santander (1792-1840). It has large plantations of coffee and cacao.

CUDDALORE, or **KUDALUR**, an important town in South Arcot, Madras, India, on the Gadelain and Pounaiyar rivers, about 125 miles S. of Madras. The river admits vessels to within about a mile from the town's limits and the harbor is the largest in South Arcot. The industries are cotton and carpet, sugar, paper, and oil. There is a fort and temple, and the environs are picturesque. Pop. about 60,000.

CUDDAPAH, or **KADAPA**, a district and town of Hindustan, presidency of Madras. The district, of which the area is 8,745 square miles, is traversed N. to S. by the Eastern Ghauts, and watered by the Pennar and its affluents. The forests contain much valuable timber, and the minerals include iron ore, lead, copper, diamonds, etc. Agriculture is in a flourishing condition, grain, cotton, and indigo being largely grown. Pop. about 1,355,000. The town lies on a small river of same name, an affluent of the Pennar, 140 miles N. W. Madras. It exports indigo and cotton.

CUENCA (kwān'kä), a city of Ecuador, on the Rio Paute, 190 miles S. S. W. of Quito; on a fertile tableland, 8,469 feet above the sea, and enjoys a perpetual spring, with a mean temperature of 58° F. Its streets are wide, and several canals intersect the town; the principal buildings are the cathedral and high school. There is some trade in cheese and grain, and manufactures of hats, woolens, earthenware, and candied fruits. Pop. about 30,000.

CUERNAVÁCA (kwār-nä-vä'kä), capital of the Mexican State Morelos, lies in a lovely and fruitful valley, about 40 miles S. of Mexico City. It has a church built by Cortes, an agricultural school, and refineries of sugar and brandy. Pop. 13,000. Near by is the famed *teocalli* of Xochicalco, with five terraces.

CUFIC, pertaining to Cufa, a town founded by Omar I., in A. D. 637, the ruins of the Parthian capital Ctesiphon having been largely used for the purpose; also relating to inscriptions and coins bearing the *kinji* or Cufic writing, or old Arabic.

CUI, CÉSAR ANTONOVITCH, a Russian composer. He was born at Vilna, Russia, in 1835, and is of French descent, his father having been one of Napoleon's officers, left behind wounded during the retreat from Moscow. He was educated at the High School, Vilna, and at the School of Engineering, Petrograd. He became a teacher and taught fortification in the three military academies; published two manuals and many articles and rose to the rank of General of Engineering. In 1864 he became a musical critic and wrote for many Russian and French papers. His literary works include: "La Musique en Russie"; "La Romance Russe"; "L'Anneau des Nibelungen"; and more than 700 articles.

His musical works include the operas: "The Mandarin's Son"; "William Ratcliffe"; "Angelo"; "Le Filibustier"; "Le Sarrazin"; "Mademoiselle Fifi"; "Le Prisonnier du Caucase"; "La Fille du Capitaine"; "Un Festin Pendant la Peste"; "Le Palladin de Neige"; "Matteo Falcone"; "Le Petit Chaperon Rouge"; "Le Chat Botté"; and many smaller pieces. He died on March 14, 1918.

CUIRASS, a breastplate; a covering for the breast; originally, as the name denotes, of leather, also of quilted linen, cloth, etc. The cuirass of plate-armor succeeded the hauberk, hacqueton, etc., of mail, about the reign of Edward III.; and from that period the surcoat, jupon, etc., which were usually worn over the coat of mail, began to be laid aside. From that time too the cuirass or breastplate continued to be worn, and was the last piece of defensive armor laid aside in actual warfare. There were cuirassiers in the English civil wars, and in the French service nearly to the end of the 17th century; after this period, the cuirass was generally laid aside, until it was again employed by some of Napoleon's regiments, and it is now, in most European services, worn by some regiments of heavy cavalry.

CULBERSON, CHARLES ALLEN, an American public official; born at Dadeville, Tallapoosa co., Ala., June 10, 1855. He was graduated at the University of Virginia, and was admitted to the bar in 1878. His ability as a lawyer was soon recognized, and in 1880 he was elected County Attorney of Marion co., Tex. After his removal to Dallas he was elected Attorney-General of the State in 1890, and re-elected two years later. In 1894, and again in 1896, he was triumphantly chosen Governor. At the Democratic National Conventions of 1896 and 1904, he served as chairman of the Texas delegation. In 1899 he succeeded Roger Q. Mills as United States Senator, and was re-elected in 1904, 1910, and 1916.

CULDEES, a religious order which at an early period had establishments in many parts of Great Britain and Ireland, but are especially spoken of in Scotland. The name is of uncertain etymology; but is probably from Celtic words meaning "attendant of God." It first appears in the 8th century, and the Culdees distinctively so called seem to have been anchorites living under their own abbots, and for long remaining independent of Rome. Otherwise archæologists have discovered no essential point either of faith, ritual, or constitution in which they differed from the other clergy of the Western Church.

CULIACAN, capital of the State of Sinaloa, Mexico, on the river of the same name, about 49 miles from the Pacific Ocean. A wide plain surrounds it, and the city itself has notable buildings, including a cathedral, mint, and ecclesiastical college, and several handsome plazas. Tobacco is grown in the vicinity, and the other industries include textiles and coffee. It is an important commercial center, and the river navigation is steadily increasing. The foundation dates back to the 16th century, when the city was known as San Miguel. Pop. about 15,000.

CULLODEN MOOR, a heath in Scotland, 4 miles E. of Inverness, celebrated for the victory obtained April 27, 1746, by the Duke of Cumberland over Prince Charles Edward Stuart (the Pretender) and his adherents. The battle was the last fought on British soil, and the termination of the attempts of the Stuart family to recover the throne of England.

CULLOM, SHELBY MOORE, an American public official; born in Kentucky in 1829. When he was a year old his family moved to Illinois, where he was educated at Rock River Seminary, Mt. Morris, Ill. In 1853, he moved to Springfield, Ill., to study law and resided there until his death. Until 1865 he continued to practice law, serving for some few years as a State Legislator. From 1865-1871 he was a member of Congress and served on important committees of that body. Taking a prominent part in the councils of the Republican party, he was nominated and elected governor of Illinois in 1876. In 1883 he was elected United States Senator, and held that position for over thirty years. For years he held the important post of chairman of the Interstate Commerce Committee. Almost his last work in the Senate was to secure the appropriations for the Lincoln Memorial, a project in which he was deeply interested. He died in 1914.

CULLUM, GEORGE WASHINGTON, an American military officer; born in New York City, Feb. 25, 1809; graduated from West Point in 1833; and was engaged for the next 28 years in engineering labors and in instructing at West Point on practical military engineering. During the Civil War he was chief of staff to the general-in-chief from November, 1861, to September, 1864, and superintendent of the military academy from September, 1804, to August, 1866. From that time he was a member of the Board of Engineers for Fortifications, until he was placed on the retired list in 1874. At the time of his retirement he was colonel and brevet Major-General in

the regular army. Besides numerous military memoirs and reports, he published "Military Bridges with India-rubber Pontoons," (1849); "Register of Officers of the U. S. Military Academy from 1802 to 1850" (1850); a translation of Duparc's "Elements of Military Art and History," with Notes, etc. (1863); a "Biographical Register of the Officers and Graduates of the U. S. Military Academy" (1868) (revised edition, 1879); "Campaigns of the War of 1812 Criticised" (1880); and contributed a number of articles to Johnson's "Universal Cyclopædia" (1874-1877). He died in New York City, Feb. 28, 1892, bequeathing $250,000 for the erection of a Memorial Hall on the grounds of the military academy, and $40,000 for furnishing it with military busts, paintings, and other appropriate objects.

CULP, JULIA, a Dutch contralto. Born in Holland in 1881, she first received instruction on the violin, and as a little girl appeared in the various cities of Holland in recitals. At fifteen years of age she entered the conservatory at Amsterdam to have her voice trained, and completed her studies in voice culture at Berlin. In 1901 she made her début as a singer in Magdeburg, and later gained great popularity throughout Germany by her singing of the German and Italian folk-songs. From 1902-1912 she toured the Continent and achieved a striking success everywhere. In 1913 she made her first tour of America, which was later followed by other tours.

CUMÆ, a very ancient city of Italy in Campania, the oldest colony of the Greeks in Italy, founded about 1030 B. C. by colonists from Chalcis, in Eubœa, and from Cyme in Asia Minor. It founded Naples (Neapolis), and in Sicily Zancle or Messina. In 520 B. C. Cumæ was taken by the Campanians, and came with them under the power of Rome (345 B. C.). It was destroyed A. D. 1207, and a few ruins only now exist.

CUMANÁ, a town of the Venezuelan state of Sucre, on the Manzanares, a mile above its mouth, where the port of Puerto Sucre lies on the Gulf of Cariaco. It has a national college, and some export trade, but is chiefly of interest as the oldest European town on the South American mainland, having been founded by Christopher Columbus's son Diego as New Toledo in 1521. It has suffered much from earthquakes, and was almost entirely destroyed in 1853. Pop. about 15,000.

CUMBERLAND, a city and county-seat of Allegany co., Md.; on the Potomac river, the Chesapeake and Ohio canal, and the Baltimore and Ohio, the Cumberland and Pennsylvania, the Western Maryland railroads; 150 miles S. E. of Pittsburgh. It is a great railroad point and the trade center for the Cumberland and George's Creek coal district. It is the second city in population and importance in the State, and has a Catholic academy and convent, a house of Capuchins, extensive paper mills, glass works, tanneries, steel and iron mills, flour and planing mills, and railroad repair shops. There are 4 National and several State and savings banks, daily and weekly newspapers, numerous churches, a Holly system of waterworks, public and private schools, high school, etc. Pop. (1910) 21,839; (1920) 29,837.

CUMBERLAND, a city of Rhode Island, in Providence co. It is on the Blackstone river, and on the New York, New Haven and Hartford railroad. In the neighborhood are granite quarries of importance. Its manufactures include horseshoes, cotton, silk, and worsted goods, and women's clothing. The town contains the only Cistercian Trappist monastery in New England: Pop. (1910) 10,107; (1920) 10,077.

CUMBERLAND, a river of the United States which runs through Kentucky and Tennessee into the Ohio, having a course of about 600 miles, navigable for steamboats to Nashville, nearly 200 miles.

CUMBERLAND, RICHARD, an English dramatist, novelist, essayist, and poet, grandson of Richard Bentley; born at Cambridge, Feb. 19, 1732. Of good family and the highest prospects, he was discredited and impoverished in public service, and made literature a profession. His comedies, "The West Indian," "The Wheel of Fortune," "The Jew," and "The Fashionable Lover," are an epitome of the culture of the time; as are his essays, collected under the title of "The Observer." He wrote "Anecdotes of Eminent Painters in Spain," "Memoirs" (1806). He died in Tunbridge Wells, May 7, 1811.

CUMBERLAND, WILLIAM AUGUSTUS, DUKE OF, third son of George II. of England; born in 1721. At the battle of Dettingen he was wounded when fighting at the side of his father, and though unsuccessful at Fontenoy, where he had the command of the allied army, he rose in reputation by somewhat brutally subduing the insurrection in Scotland caused by the landing of Charles Edward Stuart in 1745. In 1747 Cumberland was defeated by Marshal Saxe at Lafeld, and in 1757 he lost the battle of Hastenbeck, against D'Estrées, and concluded the convention at Closter-

seven, by which 40,000 English soldiers were disarmed and disbanded, and Hanover placed at the mercy of the French. He then retired in disgrace from his public office, and took no active part in affairs. He died in 1765.

CUMBERLAND GAP, a passage through the Cumberland Mountains; on the line between Kentucky and Tennessee and at the W. extremity of Virginia. It is a place about which clusters many a Civil War incident. It was occupied by Zollicoffer in his retreat Nov. 13, 1861. On March 22, 1862, a reconnoissance in force was made from Cumberland Ford to this place. The Confederate pickets were driven in, and firing began early in the morning, which continued all day, without any definite results. The Gap was occupied by the Union forces under General Morgan, June 18. Skirmishing was of almost daily occurrence. In an engagement Aug. 7, the Confederates lost in killed and wounded, 125 men; Union loss, 3 killed, 15 wounded, and 50 prisoners, large quantities of forage, tobacco, stores, horses and mules. General Morgan destroyed everything of value as war material, and evacuated the place Sept. 17, and, though surrounded by the enemy, he succeeded in saving his command, which reached Greenupsburg on Oct. 3. The Gap was occupied by General Bragg, Oct. 22. On Sept. 8, 1863, the place. with 2,000 men and 14 pieces of artillery, under the Confederate General Frazer, surrendered, without firing a gun, to General Shackelford; 40 wagons, 200 mules and a large quantity of commisary stores were captured. A three hours' skirmish occurred Jan. 29, 1864, on the Virginia road, 13 miles distant. Colonel Love, with 1,600 cavalry, 400 only of whom were mounted, with no artillery, held his position till dark and then fell back three miles to camp. On April 28, 1865, 900 Confederates surrendered, and were paroled here.

CUMBERLAND ISLAND, a peninsula (so-called), of Baffin Land, extending into Davis Strait.

CUMBERLAND MOUNTAINS, in Tennessee, part of a range of the Appalachian system, rarely exceeding 2,000 feet in height.

CUMBERLAND PRESBYTERIANS, a religious denomination which sprang up in 1810 in the State of Kentucky, in consequence of a dispute between the presbytery of Cumberland in that State, and the Kentucky Synod of the Presbyterian Church in America, concerning the ordination of persons who had not passed through the usual educational curriculum, but whose services the presbytery regarded as demanded for the ministry by the exigencies of the time. In 1916 the church had 1,317 organizations with 72,056 members; 969 Sunday Schools with 6,618 teachers, and 53,431 pupils. Their form of government is Presbyterian, though they have added a system of itinerating like the Methodists. In doctrine they approach Arminianism, denying unconditional election and predestination, and they believe in the universality of the atonement.

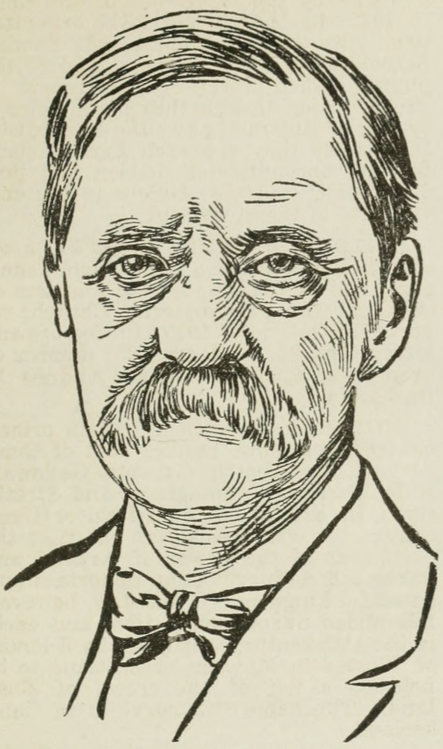
CUMBERLAND UNIVERSITY, a coeducational institution in Lebanon, Tenn.; organized in 1842, under the auspices of the Cumberland Presbyterian Church; reported at the end of 1919: Professors and instructors, 21; students, 225; number of graduates, 4,386; president, Andrew B. Buchanan.

CUMBRIA, an ancient British principality, comprising, besides part of Cumberland, the Scotch districts Galloway, Kyle, Carrick, Cunningham, and Strathclyde, its capital being Alcluyd or Dumbarton. It was possibly at one time the chief seat of the power of Arthur, and in the 6th century was an important and powerful kingdom. It speedily, however, fell under Saxon domination, and early in the 11th century was given by Edmund of Wessex to Malcolm of Scotland to be held as a fief of the crown of England. The name still survives in Cumberland.

CUMBRIAN MOUNTAINS, a range of hills, England, occupying part of the counties of Cumberland, Westmoreland, and North Lancashire. The mountains rise with steep acclivities, inclosing in some part narrow but well-cultivated valleys with numerous picturesque lakes; this being the English "Lake Country," so much frequented by tourists.

CUMMINS, ALBERT BAIRD, an American public official; born in 1850 in Pennsylvania. He was educated at Waynesburg College and from 1875 to 1878 practiced law in Chicago. Some years later he moved to Des Moines, Ia., and in 1902 was elected Governor of the State. On the death of Senator Allison, Governor Cummins was selected to fill out the unexpired term and in 1909 was elected to the Senate for the term 1909-1915. Re-elected in the latter year, he was again nominated and elected by the Republicans of his State for the term 1921-1927. Senator Cummins was much in sympathy with the principles of the Progressive party of 1912, and while he did not withdraw from the Republican party in that year as did many of his fellow-progressives, he withheld his sup-

port from Taft. He is an acknowledged authority on the railroads and wrote the



ALBERT BAIRD CUMMINS

main provisions of the Cummins-Esch Railroad Act of 1920.

CUMULATIVE VOTING, a system of voting at elections by which the voter is allowed to cast as many votes as there are candidates for a given office, distributing his votes or giving all of them to a single candidate. It is claimed that the proportional result is a more faithful reflex of the will of a community than the majority method.

CUNARD, SIR SAMUEL, founder of an English steamship line; born in Halifax, Nova Scotia, where his father, a Philadelphia merchant, had settled, Nov. 21, 1787. Becoming early a successful merchant and shipowner, he went to England in 1838, joined with George Burns, Glasgow, and David M'Iver, Liverpool, in founding (1839) the British and North American Royal Mail Steam Packet Company, and obtained a contract from the British Government for the mail service between Liverpool and Halifax, Boston, and Quebec. The first passage was that of the "Britannia" in 1840, the time occupied being 14 days 8 hours. Iron steamers were first used in 1855, and paddle-wheels gave way entirely to the screw after 1862. From its small but successful beginning, Cunard's undertaking soon developed into one of the vastest of private commercial concerns. In 1878 it was made into a joint stock company. Created a baronet in 1859, he died in London, April 28, 1865.

CUNEIFORM WRITING, the name applied to the wedge-shaped characters of the inscriptions on old Babylonian and Persian monuments; sometimes also described as "arrow-headed" or "nail-headed" characters. They appear to have been originally of the nature of hieroglyphs, and to have been invented by the primitive Akkadian inhabitants of Chaldea, from whom they were borrowed with considerable modification by the conquering Babylonians and Assyrians, who were Semites by race and spoke an entirely different language. Cuneiform inscriptions were chiseled upon stone and iron, but they were impressed upon soft clay with a pointed stylus having three unequal facets, the smallest to make the fine wedge of the cuneiform signs, the middle to make the thicker wedges, and the largest to make the outer and thick wedges of the characters. The first date that can be assigned to the use of cuneiform writing is about 3800 B. C., and its use was continued until after the birth of Christ. The earliest inscription at present known is that inscribed upon the porphyry whorl in the time of Sargon of Agade; the latest is a tablet perserved at Munich, which may have been written about A. D. 83.

The ruins found all over ancient Persepolis attracted the attention of Eastern travelers, yet no one believed that those strange wedges which completely covered some of them could have any meaning. It was Garcia de Sylva Figueroa, ambassador of Philip III. of Spain, who, on a visit to Persepolis in 1618, first thought that these signs must be inscriptions in some lost writing. Among subsequent travelers whose attention was attracted to the subject, was Chardin, who after his return to Europe in 1674, published three complete groups of cuneiforms, copied by himself at Persepolis. He likewise declared it to be "writing and no hieroglyphs; the rest, however, will always be unknown." Michaux, a French botanist, sent to Paris, in 1782, a boundary stone covered with inscriptions, which he found at Bagdad.

Niebuhr, without attempting to read the character itself, first established three distinct cuneiform alphabets instead of one, the letters of which seemed to outnumber those of all other languages

together. The real and final discovery is due to Grotefend of Hanover, and dates from 1802. On Sept. 7 of that year he laid the first cuneiform alphabet, with its equivalents, before the Academy of Göttingen. Then H. Martin found the grammatical flexions of the plural and genitive case. The last and greatest of investigators of this first alphabet was Rawlinson, who not only first copied, but also read, the gigantic Behistun inscription, containing more than 100 lines.

Inscriptions in the Persian cuneiform character are mostly found in three parallel columns, and are then translations of each other in different alphabets and languages called respectively Persian,



CUNEIFORM WRITING

Median, and Babylonian; the Achaemenian kings being obliged to make their decrees intelligible to the three principal nations under their sway. The Persian consists of 39 to 44 letters, and is the most recent, the most ancient being the Babylonian.

The cuneiform signs were originally pictures of objects and were first drawn in outline upon some vegetable substance, called in the native documents likhusi. Early in the history of Babylonia, clay was adopted as the substance upon which to write. On papyrus and leather it is quite easy to draw in outline a picture of any object; but it became more difficult to do this when clay was used, because the outlines of the object represented had to be pressed into it. The necessary result of this was that the shapes of the objects became altered, and reduced to their simplest form.

CUNLIFFE, WALTER, BARON, a British financier, born in 1855, and educated at Harrow and Trinity College, Cambridge. He engaged in finance in the city of London and became a member of Cunliffe Brothers. He became director of the Bank of England in 1895, Deputy-Governor, 1911, and was Governor 1913-1918. He was Lieutenant of the city of London, director of the North Eastern Railway Co., and patron of the living of Headley, Surrey. In 1915 he received the 1st Class, Order of St. Anne (Russia); in 1916, the Grand Cross, Order of the Crown of Italy; Grand Cross, Order of Redeemer, Greece; Grand Cordon Rising Sun, Japan. He was also made Commander of the Legion of Honor, France, and Commander of the Order of Leopold, Belgium.

CUNNINGHAM, ALLAN, a Scotch poet and miscellaneous writer; born in Keir, Dumfriesshire, Dec. 7, 1784. When a youth he served as an apprentice to a stone-mason; but later became a reporter in London, and wrote "Sir Marmaduke Maxwell," a dramatic poem, and "Lord Roldan" and "Paul Jones," romances. His "Critical History of the Literature of the Last Fifty Years," and other books, prompted Sir Walter Scott to call him a genius. He died in London, Oct. 30, 1842.

CUNNINGHAM, WILLIAM, a Scotch theologian; born in Hamilton, in 1805; educated at Duns and Edinburgh; and ordained minister at Greenock in 1830. He was called to Trinity College Church, Edinburgh, in 1834, and soon became one of the foremost leaders, alike on the platform and in the pamphlet, on the "Non-intrusionist" side in the great controversy that preceded the Disruption of 1843. He was appointed Professor of Theology in the Free Church College in 1843, of Church History in 1845, and its

principal on Chalmers's death in 1847. His D. D. degree was given him by Princeton in 1842. He was moderator of the Free Assembly in 1859, when he received a testimonial amounting to over $35,000. He died in Edinburgh in 1861.

CUPID, the god of Love, generally represented as a beautiful naked boy, winged, blind, and armed with a bow and a quiver full of arrows, with which he transfixed the hearts of lovers, kindling desire in them. He was equivalent to, but not perfectly identical with, the Erōs of the Greeks. He was supposed to be the son of Mercury and Venus.

CUPPING, a surgical operation consisting in the application of the cupping-glass in cases where it is desirable to abstract blood from, or draw it to, a particular part. When blood is removed the operation is simply termed cupping; when no blood is abstracted, it is dry-cupping. The cupping-glass, a cup-shaped glass vessel, is first held over the flame of a spirit-lamp, by which means the included air is rarefied. In this state it is applied to the skin, and as the heated air cools it contracts and produces a partial vacuum, so that the skin and integuments are drawn up slightly into the glass and become swollen. If blood is to be drawn, a scarificator or spring-lancet is generally used.

CUPRITE, CUPROUS OXIDE, Cu_2O, found either as a red earth, or as brilliant, transparent crystals of a ruby-red color, specific gravity, 6.0. It contains 88.8 per cent. copper, and is widely distributed, occurring in many parts of the United States. A crystalline variety is known as chalcotrichite, while tile-ore is the name given to one of the earthy varieties.

CUPULIFERÆ, diclinous exogens, so called from possessing a cupule which takes the form of a bony or coriaceous one-celled nut, more or less inclosed in an involucre.

CURA, or **CIUDAD DE CURA**, a city of Venezuela, formerly capital of the state of Miranda, near Lake Valereia, 56 miles W. of Caracas. The site is 1,600 feet above sea-level, with a steep hill behind it and a wide valley before it. Situated near the llanos of the Guarico, it has a considerable commerce in cotton, sugar cane, coffee, cocoa, indigo, general agricultural products, and cattle. It was founded in 1730 and was the scene of several battles in the War of Independence. In 1900 an earthquake did considerable damage. Pop. about 13,000.

CURAÇAO (kö-ra-sa'ō), an island of the Dutch West Indies in the Caribbean Sea; 46 miles N. of the coast of Venezuela; area, 210 square miles; capital, Willemstad; principal harbor, Santa Anna. It is hilly, wild, and barren, with a hot, dry climate. Yellow fever visits it every sixth or seventh year. Fresh water is scarce, and serious droughts occur. The tamarind, cocoa-palm, banana, and other useful trees are reared; among them three varieties of orange, from one of which the Curaçao liqueur is made. Sugar, tobacco, cochineal, and maize are also produced, but the staple exports are salt, and a valuable phosphate of lime used as a manure in its natural state, or made to yield valuable superphosphates. The islands of Curaçao, Bonaire, Oruba (or Aruba), St. Martin, St. Eustache, and Saba form a Dutch government, the residence of the governor being at Willemstad. From the 16th century Curaçao was held in succession by the Spaniards, Dutch, and British, and finally ceded to Holland in 1814. Pop. (1918) 34,639, of the colony, 57,195.

CURAÇAO, or **CURAÇOA**, a liqueur or cordial prepared from a peculiar kind of bitter oranges growing in Curaçao, which have a persistent aromatic odor and taste. It is prepared from the yellow part of the rind.

CURASSOW, the name given to a large gallinaceous bird, *Crax alector*, more fully denominated in English the crested curassow. The upper parts are deep black, with a glow of green on various parts; the lower parts dull white, a color found also on the lower tail coverts. The curassow is found in flocks in the forests of Mexico, Guiana, and Brazil.

CURATOR, in civil law, the guardian of a minor who has attained the age of 14, of persons under various disabilities, or of the estate of deceased or absent persons and insolvents. In learned institutions the person who has charge of the library or collections of natural history, etc., is often called the curator.

CURÉ (kü-rā'), the name applied in France to a priest with a cure of souls. Commonly applied to any pastor with spiritual functions.

CURES, an ancient town of the Sabines, 25 miles N. E. of Rome, whence the Romans, after the people of Cures united with them, came to be called Quirites.

CURFEW, a bell rung every evening as a signal to the people to extinguish all fires and retire to rest. It was introduced into England by William the Conqueror, most probably as a safeguard against fire, but it was regarded by the English as a badge of servitude. The

original time for ringing it was 8 o'clock P. M. In a few places in England the custom is still kept up of ringing a bell at 9 o'clock P. M., and the old name is retained.

CURFEW LAWS, in the United States, laws intended to keep young people off the streets after a certain hour at night.

CURIA, anciently one of the 30 divisions of the Roman people, which Romulus is said to have established; also the place of assembly for each of these divisions. The *comitia curiata* was the assembly of the people in curiæ.

CURIA, PAPAL, in its stricter sense the authorities which administer the Papal primacy; in its common wider use all the authorities and functionaries forming the Papal court. The different branches of the curia having respect to church government are the sacred congregation of cardinals, the secretariat of state, and the vicariate of Rome, the machinery employed being supplied by the chancery, the dataria, and the camera apostolica. As "supreme judge" in Christendom the Pope acts through special congregations and delegated judges, or through the regular tribunals of the rota and segnatura, and the penitenziaria. The institution of the Papal Chapel and the household of the Pope are also classed as departments of the curia; and finally the functionaries maintaining the external relations of the Pope—legates, nuncios, apostolic delegates, etc. Formerly the curia included besides these the mechanism and functions of secular administration.

CURIE, MARIE SKLODOWSKA, a French scientist. She was born at Warsaw, 1867, and was educated at the Lycée de Varsovie, and later at the Sorbonne, Faculté des Sciences, Paris. She graduated in physical science, and mathematics and received the degree of Licenciée in both departments, as well as that of Docteur des Sciences. In 1910 she received the Albert Medal of the Royal Society of Arts. She has been professor at the École Normale Supérieure at Sèvres and since 1919 has been professor of Radiology at Warsaw. During 1920 it was made known that she had made further discoveries in the direction of the use of radium in the treatment of disease. Her works include: "Recherches sur les propriétés magnétiques des aciers trempés"; "Recherches sur les substances radioactives."

CURIE, PIERRE a French scientist. He was born in Paris in 1859, and received his education in the schools of his native city, showing an early bent toward the study of physics in which he experimented with profitable results. When 36 years old he became professor of physics at the École municipale de chimie et de physique. The investigations of himself and his wife (CURIE, MARIE SKLODOWSKA, *q. v.*) in 1869 resulted in the discovery first of polonium and then of radium. This latter discovery brought them world-wide celebrity and they received many prizes and honors. In 1904 M. Curie became professor of physics at the Sorbonne, and in 1905 was elected to the Institute de France. He was run over and killed in a street in Paris in 1906.

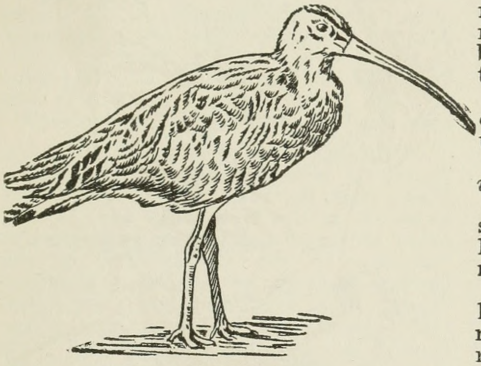


MME. CURIE

CURLEW, a wading bird, *Numenius urquatus,* of the family *Scolopacidæ* (Snipes). Male of a bright ash color on the head and breast, here and there clouded with red, white on the belly, and spotted. Female more ash-colored, the red less pure. It is found in most parts of the world. In Scotland it is called the whaup. It lays a large egg, olive-green and spotted with dark green and brown. There are several American species.

CURLING, a game of Scotch origin, played on ice with various shaped stones, fitted with handles or grips. Wherever Scotchmen wander they take their "channel-stanes" with them, and at the first

opportunity institute the "roarin' game," as it has been very appropriately called. The game does not require much apparatus. Given a smooth sheet of ice not less than 60 yards in length, a set of stones, eight keen players each armed with a broom, and nothing more is needed. Simple as it may seem at first sight, the game is one demanding great dexterity and skill, not to mention strength and endurance, on the part of those who aspire to be first-class players. Four players, two on each side, stand at either end, having two stones apiece, and the game consists in trying which can lay their stones nearest to the "tee," *i. e.*, the center of the concentric circles marked out on the ice at the far end of the rink. The stones used are made of granite or whin, and must not exceed 50 pounds in weight nor be more than 36 inches in circumference. Iron "stones" are also much in vogue, because of it being possible to make much more scientific play with them.



CURLEW

CURRAN, JOHN PHILPOT, an Irish advocate and orator; born in Newmarket, County Cork, in 1750. In 1783 he obtained a seat in the Irish Parliament as member for Kilbeggan. In debate, Curran, who was one of the few Liberal members then in the House, was usually charged with the duty of replying to opponents; for which important duty his ready speech and cutting retort admirably qualified him. In 1788, he was in favor of the formation of the Irish volunteers; and, in subsequent years, he was constant and eloquent in his appeals to government to adopt a different policy toward Ireland, as that which it was pursuing was likely to drive the people into rebellion. Government gave no heed, and the rebellion of 1798 was the consequence. Curran had retired from Parliament before the Union, of which he was a warm opponent. He was appointed Master of the Rolls in Ireland in 1806, an office he held till 1813, when he resigned. He died in London in 1817.

CURRANT, a delicious fruit. The dried currants of the stores are the fruit of a small grape cultivated in what was the ancient Ithaca (the island of Ulysses), at Patras in the Morea, in Zante, Cephalonia, etc. Currants in this sense were introduced into England in the 16th century, under the name of corinthes. The name is also given to a number of shrubs, placed in the genus *Ribes*, and by De Candolle in the sub-genus *Ribesia*. About 40 so-called species are known.

Red currant (*Ribes rubrum*) is a well-known garden shrub in various respects resembling its ally the black currant, but having red fruit. It is found apparently wild in mountainous districts in the N. parts of the United States, in Scotland, and the N. of England, as well as in the N. of Continental Europe, and in Siberia.

Red-flowered currant, or bloody currant, is an ornamental species with large racemes of deep rose-colored flowers, and bluish-black berries. It is indigenous to the N. W. coast of this country.

Hawthorn currant-tree (*Ribes oxyacanthoides*) is indigenous to Canada and the Northern States.

Golden-flowered currant (*Ribes aureum*) is another American species.

Dark purple-flowered currant is a species of currant wild on the Altai Mountains, and the mountainous regions near the Ural river.

Black currant (*Ribes nigrum*) has leaves of a strong smell. The black currant is found at large, but probably not really wild, in Great Britain, besides which it is found in Sweden and the N. of Russia, and in the S. of Europe, though there more sparingly.

CURRENCY, the current money or circulating medium of a country, whether in coin or in paper. The metallic currency comprises the gold, silver, nickel, and copper coin in circulation in any country; but for these three latter aids to circulation the metallic currency would fall far short of the necessities of the country. In the United States, England, and France bronze coin is used instead of copper. Nickel minor coins, 25 per cent. nickel and 75 per cent. copper, are used in Belgium, Switzerland, Germany, and the United States. Coins of platinum have been used in Russia. Paper currency comprises treasury notes, banknotes, bills of exchange, or checks, which circulate as substitutes or representatives of coin.

CURRENT METER, an instrument for measuring the rate of flow of water.

in streams, canals, or rivers. The velocity of a stream is usually measured to determine the amount of flow. The modern current meter, which is an evolution of the type introduced in 1790 by Woltmann, a German hydraulic engineer, consists essentially of a vertical metal rod, weighted at the bottom. A tail is fastened to this rod, which keeps the apparatus in the proper position. Attached to the rod, and at right angles to it is a device consisting of a wheel with cupped vanes, and a rudder which keeps the wheel facing the current. This wheel is connected with a device which records its revolutions. From a known relation between the number of revolutions in a given time and the speed of the water, the rate of flow of any stream can be determined. The instrument is calibrated by drawing it at various known speeds through still water.

CURRIE, SIR ARTHUR WILLIAM, a British soldier. He was born in 1875 and, after receiving his preliminary education, entered the army. After a period of military training in England he went to Canada and was gradually promoted until he became Inspector-General. He served in the World War, 1914-1918. In 1915 he was made C. B.; in 1917 K. C. M. G.; in 1918 K. C. B.; and in 1919 G. C. M. G. In 1917-1919 he commanded a Canadian corps in France and was mentioned in dispatches. He also received the cross of the Legion of Honor, 3d class.

CURTIN, ANDREW GREGG, an American politician; born in Bellefonte, Pa., April 22, 1815. He studied law at Dickinson College, and was admitted to the bar in 1839. Entering politics, he became secretary of the commonwealth of Pennsylvania in 1854, governor in 1860, and again in 1863, being one of the most noted "war governors." In 1869 he was appointed minister to Russia. In 1873 he left the Republican party, and from 1881 to 1887 sat in Congress as a Democrat. He died in Bellefonte, Pa., Oct. 7, 1894.

CURTIN, JEREMIAH, an American linguist and antiquarian; born in Milwaukee, Wis., in 1838. He has written: "Myths and Folk-Lore of Ireland"; "Tales of the Fairies and the Ghost World"; "Myths and Folk-Tales of the Russians, Western Slavs, and Magyars"; etc. He was a proficient in the Slavic tongues; made addresses in Czech, and translated much from Russian and Polish. He died in 1906.

CURTIS, CHARLES, an American public official, born in 1860 in Topeka, Kan., of an Indian family. He was educated in the public schools, and admitted to the bar in 1881, served two terms as district attorney of Shawnee county, and from 1893 to 1897 represented the Fourth Kansas district in Congress. From 1897 to 1907 he represented the First Kansas district in the National legislature. When Senator Burton resigned from the Senate in 1907, Curtis was elected to fill out his unexpired term. Although he was again a candidate on the Republican ticket for the term 1913 to 1920, he was defeated by the Democratic sweep of 1912. In 1915, when the Republicans regained control of the State, he was elected to the Senate for the term 1915 to 1921.

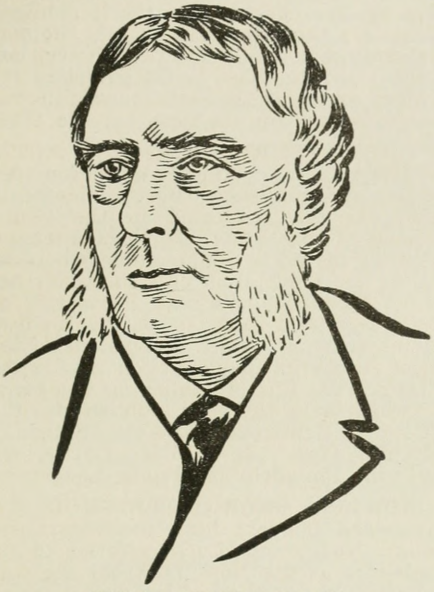
CURTIS, CYRUS HERMANN KOTZSCHMAR, an American newspaper owner and publisher. Born in Maine in 1850, he was educated in the public schools of that State. In the Centennial year he moved to Philadelphia where he began the publication of a magazine entitled "The Tribune and Farmer." A few years later he published the "Ladies' Home Journal," which became one of the most successful magazines in the United States. The Curtis Publishing Company, of which he is the head, publish also the "Country Gentleman" and the "Saturday Evening Post." In 1913 Mr. Curtis took over the Philadelphia "Public Ledger."

CURTIS, GEORGE TICKNOR, an American lawyer; born in Watertown, Mass., Nov. 28, 1912. In addition to his eminence at the New York bar, he was noted as the author of an authoritative "History of the Constitution of the United States"; he published likewise: "Digest of English and American Admiralty Decisions," "American Conveyancer," "Life of James Buchanan," "Life of Daniel Webster," "Creation or Evolution," and "John Charaxes," a novel. He died in New York, March 28, 1894.

CURTIS, GEORGE WILLIAM, an American author; born in Providence, R. I., Feb. 24, 1824. He was an early abolitionist, and a leader in the Republican party from the first; for many years the editor of "Harper's Weekly," and the writer of the "Editor's Easy Chair" in "Harper's Monthly," besides the "Manners Upon the Road" series for "Harper's Bazar" (1867-1873)). He was also a lecturer of great popularity. His works include: "Nile Notes of a Howadji" (1851); "The Howadji in Syria" (1852); "Lotus Eating" (1852); "Potiphar Papers" (1853); "Prue and I" (1856); "Trumps" (1862); and others. He died on Staten Island, N. Y., Aug. 31, 1892.

CURTIS, WILLIAM ELEROY, an American journalist; born in Akron, O., Nov. 5, 1850. He has written: "Capitals of Spanish America" (1888); "The Land

of the Nihilist" (1888); "Japan Sketches," "Venezuela," "Life of Zachariah Chandler," "The Yankees of the East," etc. He was for several years director of the Bureau of American Republics, and was chief of the Latin-American department and historical section of the World's Columbian exposition, 1891-1893. He died in 1911.



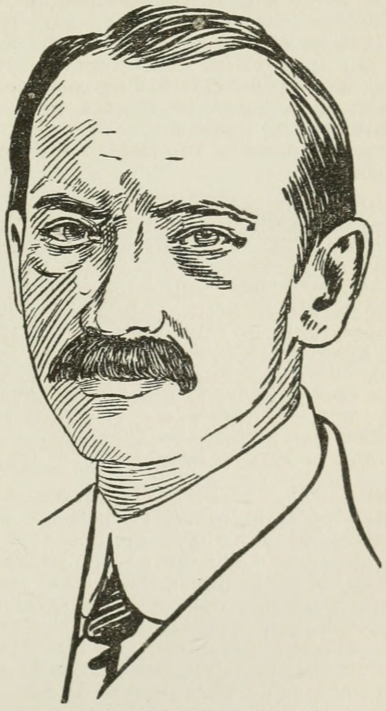
GEORGE WILLIAM CURTIS

CURTISS, GLENN HAMMOND, an American aviator. He was born at Hammondsport, N. Y., in 1878, beginning work as a newsboy and later developing into a mechanic and cycle rider. In 1906 he established a record for the fastest mile on a motor cycle, and later experimented with flying machines. His first international cup was won in the contest at Rheims in 1909, and he also won the $10,000 prize offered by the New York "World" in 1910 for the New York-Albany flight. He also engaged in the manufacture of aeroplanes, becoming president of the Curtiss Aeroplane Co. at Hammondsport, and treasurer of the Curtiss Exhibition Co. During the World War the Curtiss Engineering Corporation produced the "NC-1," the largest seaplane in the world, making a flight with fifty men on board, a record which was bettered only in 1920.

CURTIUS, ERNST (kör'tsē-ös), a German archæologist and historian; born in Lübeck, Sept. 2, 1814. His studies were all directed toward Grecian antiquity, and he visited Greece repeatedly on scientific missions. "Peloponnesus" (1851) is a history of that peninsula. His "Greek History" is a scholarly work written in a popular style. His works on "Olympia" and other ancient cities are addressed rather to scholars than to the general public. He died July 11, 1896.

CURTIUS, MARCUS, a Roman hero, who devoted himself to the infernal gods for the safety of his country. According to the legend, a wide chasm having suddenly appeared in the Forum, the oracle declared that it never would close until Rome threw into it its most precious possessions. Thereupon Curtius, arming himself, mounted his horse, and saying that Rome contained nothing more precious to its greatness than a valiant citizen fully accoutered for battle, he solemnly threw himself into the abyss, which instantly closed over his head, B. C. 362.

CURVE, a line by a moving point which continually changes its direction in contradistinction to a straight line. A curve which lies wholly in a plane is called a plane curve or curve of simple curvature; but when a curve lies partially outside of a plane it is called a



GLENN HAMMOND CURTISS

curve of double curvature or a skew, tortuous or twisted curve. Ordinary curves can be defined as geometrical loci, by a

prescribed kinematic movement of a point or a line, according to the methods of analytic geometry, by an equation between co-ordinates, as the intersection of a plane by an irregular surface. The ellipse for example can be represented in all four of these methods: as the geometrical locus of all points for which the sum of the distances of two given points—the foci—is constant. Kinematically by an ellipsograph or oval; by an equation of the second rank, and by the section of a cone by a plane.

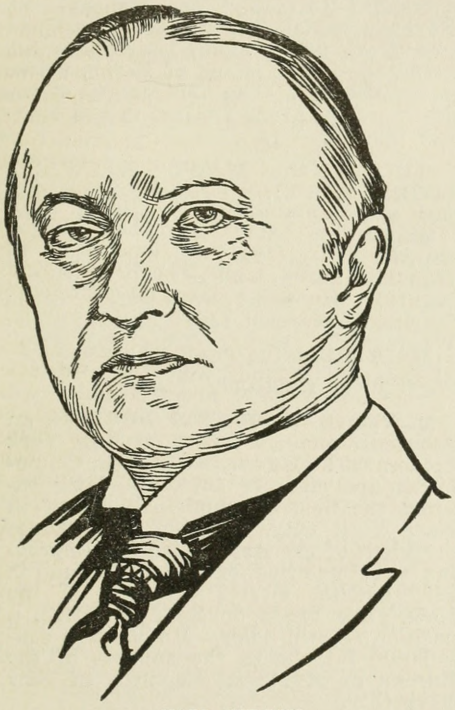
The consideration of curves as geometrical loci is based on the principles of the geometry of Euclid and is the most ancient method of studying curves and discovering new kinds. Far more fruitful and speedy in their results are the methods of analytical geometry, the science of which was established by Descartes in 1637, especially through the use of the differential and integral calculus. In this way the peculiarities of curves may be investigated on purely mathematical methods, and on the other hand the analytical geometry of the theory of functions offers a means of establishing the functions as curves and thereby giving a clear image of their course. According to the nature of the equation on which they are based, curves are called algebraic, containing powers of x and y, or transcendental, where they involve logarithms. Algebraic curves are distinguished according to the rank or order of the equation. Thus, we have curves of the 2d rank or conic sections, of the 3d rank or cubic curves, of which there are many varieties, including Newton's foliate or 41st species, and the 4th rank or quartic, and so on. The analytic investigation of a curve is especially directed toward the characteristics of its tangents and normals, toward its point of osculation as well as toward its asymptotes and its peculiar points or singularities. Curves can be likewise defined according as one prescribes their tangents or normals or the characteristics of their curvation from which the equation of the curve is deduced. A frequently recurrent condition of curves is that they are regarded as inclusive of their tangents whereby, for example, the caustic curves, the trajectories and tractories are found. Also through investigation of the nadir-curves and the evolutes arise many forms of curves and relations among well-known kinds. The number of points in which a curve of any order in general is drawn is called its rank; the number of tangents which in general may be drawn from any given point to a curve is called its class. Between rank, class, and the number of their distinguished points and tangents, double points, return points, double tangents, periodic tangents, come a series of continuously valid relations, the Plücker's Formulas. For example, every curve of the 3d rank without double point is of the 6th class, with double point is of the 4th class, with return point of the 3d class. Besides the analytical methods for the investigation of curves there are the synthetic methods devised especially by Poncelet, Steiner, and Staudt. Projection geometry has proved of great use in the investigation of cones. For description and illustration of the principal curves, see their respective titles.

CURWOOD, JAMES OLIVER, an American author, born at Owosso, Mich., in 1878. He studied in the literary department of the University of Michigan, and for 7 years was engaged in newspaper work. Later he spent much time in the Canadian Northland, where he traveled as far north as the Arctic coast. He was employed by the Canadian Government as an explorer and descriptive writer. Among his books are "The Courage of Captain Plum" (1908); "The Danger Trail" (1910); "The Valley of Silent Men" (1911); "Nomads of the North" (1919); and "The River's End" (1919). He was a frequent contributor to magazines.

CURZOLA, the most beautiful of the Dalmatian islands, in the Adriatic, stretching W. to E. about 25 miles, with an average breadth of 4 miles; area, 85 square miles. It is covered in many places with magnificent timber. The fisheries are very productive. It contains a town of the same name.

CURZON OF KEDLESTON, GEORGE NATHANIEL, EARL, a British statesman; born in Kedleston, England, in 1859. He was educated at Eton and Balliol College, Oxford. In 1885 he was assistant private secetary to the Marquis of Salisbury; in 1891 and 1892, Under-Secretary of State for India; and from 1895 to 1898, Under-Secretary of State for Foreign Affairs. From 1899 to 1905 he was Viceroy and Governor-General of India. He represented the Southport division of southwest Lancashire in Parliament, from 1886 to 1898. In 1908 he was Irish Representative Peer, and since 1916 Leader of the House of Lords. In 1915-1916 he was Lord Privy Seal; in 1916 President of the Air Board, later in that year becoming Lord President of the Council, and also member of the Imperial War Cabinet. In 1920 he was Secretary of State for Foreign Affairs. In 1895 he married Mary Victoria, daughter of L. Z. Leiter, Washington,

D. C., who died in 1906. He traveled extensively in central Asia, Persia, Afghanistan, Siam, Indo-China, and Korea, and received in 1895 the Gold Medal of the Royal Geographical Society, of which society he was president from 1911 to 1914. Among the many other honors which have been bestowed upon him were a fellowship in the British Academy (1908); a fellowship in All Souls' College, Oxford (1883); honorary degrees from the universities of Oxford (1904), Cambridge (1907), Manchester (1908), Glasgow (1911), and Durham (1913). He was also made Romanes Lecturer at Oxford University in 1907, Lord Rector of Glasgow University in 1908, Honorary Fellow of Balliol College in 1907, Rede



EARL CURZON

Lecturer of Cambridge University in 1913, Lord Warden of the Cinque Ports 1904 to 1905, and Trustee of the National Gallery in 1911. He wrote "Russia in Central Asia" (1889); "Persia and the Persian Question" (1892); "Problems of the Far East" (1894); "Lord Curzon in India" (1906); "Principles and Methods of University Reform" (1909); "Modern Parliamentary Eloquence" (1913); "War Poems and Other Translations" (1915); "Subjects of the Day" (1915); etc.

CUSHING, CALEB, an American jurist, statesman, and diplomatist; born in Salisbury, Mass., Jan. 17, 1800. He was United States commissioner to China (1843-1844); Attorney-General (1853-1857); counsel before the Geneva Arbitration Tribunal (1871-1872); minister to Spain (1874-1877). He published: "Reminiscences of Spain," "Life of William Henry Harrison" (1840); "History of Newburyport" (1826); etc. He died in Newburyport, Mass., Jan. 2, 1879.

CUSHING, FRANK HAMILTON, an American ethnologist; born in Northeast, Pa., July 22, 1857. At first a farmer boy, he became interested in Indian relics, and when 19 years old was made curator of the ethnological exhibit at the Centennial Exposition in Philadelphia. Accompanying Powell's New Mexico expedition, he settled among the Zuni Indians for the purpose of study. In 1881 he conducted excavations in Arizona, and in 1895 discovered archæological remains in Florida. In 1897 he became connected with the United States Bureau of Ethnology. Among his works are "The Myths of Creation," and "The Arrow." He died in Washington, April 10, 1900.

CUSHING, WILLIAM BARKER, an American naval officer; born in Delafield, Wis., Nov. 4, 1842. He entered the navy as a volunteer officer in 1861, and distinguished himself in a number of brilliant operations. His greatest exploit was in October, 1864. For some time previous nothing had been able to cope with the Confederate ram "Albemarle" in the sounds of North Carolina. She had successfully encountered a strong fleet of Federal gunboats and fought for several hours without sustaining material damage. Cushing volunteered to destroy the ram, and on the night of Oct. 27 accomplished the feat. For this he received the thanks of Congress, and was made a lieutenant-commander, becoming a commander in 1872. He died in Washington, D. C., Dec. 17, 1874.

CUSHMAN, CHARLOTTE SAUNDERS, an American actress; born in Boston, July 23, 1816; appeared first in opera in 1834, and as Lady Macbeth in 1835. Miss Cushman played sometimes in high comedy, but her name is identified with tragic parts. In 1844 she accompanied Macready on a tour through the Northern States, and afterward appeared in London, where she was well received in a range of characters that included Lady Macbeth, Rosalind, Meg Merrilies, and Romeo—her sister Susan (1822-1859) playing Juliet. Miss Cushman retired from the stage in 1875, and died in Boston, Feb. 18, 1876.

CUSTER, GEORGE ARMSTRONG, an American soldier; born in New Rum-

ley, O., Dec. 5, 1839; graduated at West Point in 1861; and served with distinction during the Civil War, retiring with the rank of Major-General. He afterward had various cavalry commands in the West, and several times defeated hostile Indians. On June 25, 1876, with a force of 1,100 men, he attacked a body of Sioux, afterward found to number some 9,000, encamped on the Little Big Horn, in Montana, and he and his entire command were destroyed.

CUSTIS, GEORGE WASHINGTON PARKE, an American writer; born in Mt. Airy, Md., April 30, 1781; was the adopted son of George Washington. He wrote "Recollections of George Washington" (1860), and several plays and orations. He died at Arlington House, Fairfax co., Va., Oct. 10, 1857.

CUSTOMS, indirect taxes levied on goods imported into, or exported from, a country. In the United States export duties are forbidden by the Constitution. The import duties are of five kinds, namely, ad valorem, compound, discriminating, minimum, and specific. Ad valorem duties are a tax of a certain percentage of the value of the merchandise. Compound duties are a mixture of specific and ad valorem duties and are applied to manufactured articles, the raw materials of which are dutiable. Discriminating duties are additions to the usual rates levied on goods imported from certain countries or portions of the world, or imported in vessels of certain nations. Specific duties are a tax of a certain specified sum for each pound or yard, or other unit of measure of the merchandise; usually irrespective of its quality or value, though sometimes it is provided that they shall vary with variations between specified limits of the quantity or value of the goods.

CUSTOZZA (kös-tōts'a), a village 10 miles S. W. of Verona, where the Italians have twice been utterly defeated by the Austrians. On July 23-25, 1848, Charles Albert was routed after severe fighting by Radetzky with a smaller force, and forced to retreat behind the Mincio; and on June 24, 1866, Victor Emmanuel with 130,000 men was defeated by the Archduke Albert with 75,000 men.

CUTCH, a state in the W. of India, lying to the S. of Sind; under British protection; area, 6,500 square miles. During the rainy season it is wholly insulated by water, the vast salt morass of the Rann separating it on the N. and E. from Sind and the Guicowar's dominions. Its S. side is formed by the Gulf of Cutch, and on the W. it has the Arabian Sea. The country is subject to violent volcanic action. The date is the only fruit which thrives, and the principal exports are cotton and horses. The Rann of Cutch, a morass, covers about 9,000 square miles, and is dry during the greater part of the year. Pop. of the state about 525,000.

CUTHBERT, ST., a celebrated father of the early English Church; born, according to tradition, near Melrose, about 635. He became a monk, and in 664 was appointed prior of Melrose, which after some years he quitted to take a similar charge in the monastery of Lindisfarne. Still seeking a more ascetic life, Cuthbert then retired to the desolate isle of Farne. Here the fame of his holiness attracted many great visitors, and he was at last persuaded to accept the bishopric of Hexham, which he, however, resigned two years after, again retiring to his hermitage in the island of Farne, where he died in 687. The anniversary of his death was a great festival in the English Church.

CUTTING, MARY STEWART (DOUBLEDAY), an American novelist and short-story writer; born in New York City in 1851. While still a girl, she wrote verse for "Lippincott's." In 1875 she married Charles W. Cutting. Her most important novels were: "Little Stories of Married Life" (1902); "The Wayfarers" (1908); "Just for Two" (1909); "The Lovers of Sanna" (1912); "Refractory Husbands" (1913).

CUTTING, R(OBERT) FULTON, an American financier; born in New York City in 1852. He graduated from Columbia in the class of 1871, and later entered the field of municipal reform in New York City. In 1892 he became president of the Association for Improving the Condition of the Poor, and in 1899 he was elected president of the New York Trade School Association, a position he still holds. He has also contributed largely to the support of the Bureau of Municipal Research in New York City.

CUTTLEFISH, a genus and family of cephalopodous mollusks of the order *Dibranchiata*. The body is oblong and depressed, sack-like, with two narrow lateral fins of similar substance with the mantle; the whole shell is light and porous. The eyes are very large, and the head is furnished with eight arms, each of which has four rows of suckers and two long tentacles expanded and furnished with suckers on one side at the extremity.

CUTTY STOOL, a low stool, the stool of repentance, a seat formerly set apart

in Presbyterian churches in Scotland, on which offenders against chastity were exhibited before the congregation and submitted to the minister's rebukes before they were readmitted to church privileges.

CUVIER, GEORGES CHRÉTIEN LÉOPOLD DAGOBERT, BARON (küvē-ā′), one of the greatest naturalists the world has produced; born in Montbéliard, France, Aug. 23, 1769. After finishing his education at Stuttgart, he accepted the situation of tutor in a Protestant family in Normandy. The Abbé Texier, whom the troubles of the time had driven into exile from the capital, introduced him by letter to MM. Jussieu and Geoffroy. Several memoirs, written about this time, and transmitted to the latter, established his reputation and procured his admission to two or three of the learned societies in Paris. In 1800 he was appointed successor to Daubenton as Professor of Natural History at the College of France, and in 1802 he succeeded Mertrud in the chair of Comparative Anatomy at the Garden of Plants. From that time he devoted himself steadily to the studies which have immortalized his name. His "Lessons in Comparative Anatomy," and the "Animal Kingdom," in which the whole animal kingdom is arranged according to the organization of the beings of which it consists, have raised him to the pinnacle of scientific fame, and established him as perhaps the first naturalist in the world after Linnæus.

His numerous memoirs and works on these subjects show a master-mind in the study of zoölogy; and extending the principles laid down in his comparative anatomy to the study of paleontology, he has been enabled to render immense service to geology. His "Animal Kingdom" has been frequently translated, and forms the basis of all arrangements followed at the present time. Cuvier filled many offices of great importance in the State; particularly those connected with educational institutions. Napoleon treated him with much consideration; Louis XVIII. and Charles X. advanced him to honor; and Louis Philippe raised him to the rank of a peer of the realm. He died in Paris, May 13, 1832.

CUVILLIER, CHARLES, a French composer. He received his musical education at the Conservatoire de Paris under Professor Massenet. After having attained his degree of bachelor he made his entry into the Conservatoire and his training under Massenet was followed by his first operetta, "Avant-hier Matin," composed in collaboration with Tristan Bernard in 1905. It was played in Paris at the Capucines. His other works include: "La Carte Forcée," "Son Petit Frère," "Les Rendez-vous strasbourgeois," "Afgar," "Les Muscadines," "La Reine s'amuse," "Sappho," "Lilac Domino," "Florabelle," "La Fausse Ingénue.

CUYABÁ, the capital of the Brazilian state of Matto Grosso, occupies pretty nearly the center of South America. It stands on the left bank of the Cuyabá river, 980 miles N. W. of Rio de Janeiro. Founded by gold-diggers in 1719, and wrecked by an earthquake in 1746, it is now a well-built place, with a cathedral and 14,500 inhabitants (1917). It can be reached by the rivers Paraná and Paraguay, a voyage of 2,500 miles from Buenos Aires.

CUYLER, THEODORE LEDYARD, an American clergyman; born in Aurora, N. Y., Jan. 10, 1822. He was graduated at Princeton College in 1841 and at Princeton Theological Seminary in 1846. From 1860 he was pastor of Lafayette Avenue Presbyterian Church in Brooklyn, resigning to devote his time to literary and reform work. He has written "Newly Enlisted," "Christianity in the Home," etc. He died Feb. 26, 1909.

CUYP, or KUYP, JACOB GERRITSZ, a Dutch painter; commonly called the Old Cuyp; born in Dordrecht, Netherlands, in 1575. Jacob Cuyp's representations of cows and sheep, battles and encampments, are clever, but his fame rests principally on his excellent portraits. His coloring is warm and transparent; his manner free and spirited. Cuyp was one of the four founders of the Guild of St. Luke at Dordrecht, and died after 1649. ALBERT CUYP, Jacob's son, was also born in Dordrecht, in 1620. He excelled in the painting of cattle grazing or reposing, wintry landscapes, horse-markets, hunts, camps, and cavalry-fights; and in rendering effects of warm golden sunlight he is without a rival. During his lifetime and long after, Albert's pictures were held in little estimation. England is particularly rich in his works, the National Gallery possessing eight of his subjects. He died in Dordrecht, in 1691. BENJAMIN CUYP, a nephew of Albert, was born in Dordrecht, in 1608, and became a member of the guild there in 1631. He painted Biblical pieces of country life. His best works are in the manner of Teniers.

CUYUNI, a river of South America, rises in Venezuela, flows first N., then E. through British Guiana, and joins the Mazaruni just above the confluence of the latter with the Essequibo. It has numerous rapids and falls; the lowest is

at 59° 3′ W., about 30 miles above the mouth of the river.

CUZCO (köz'ka), an inland city of Peru, capital of a department of same name (area, 156,270 square miles; pop. about 500,000), and formerly capital of the empire of the Incas, at the foot of some hills, 11,380 feet above the level of the sea, about 400 miles E. S. E. of Lima. According to tradition, this town was founded in 1043, by Manco Capac, the first Inca of Peru. The grandeur and magnificence of the edifices, of its fortress, and of the Temple of the Sun, struck the Spaniards with astonishment in 1534, when the city was taken by Francis Pizarro. On the hill toward the north are yet seen the ruins of a fortress built by the Incas. Pop. about 15,000.

CYANAMID. $NC.NH_2$, formed by the action of ammonia on cyanogen chloride. The name is also applied to the compound calcium, Cyanamid NC.NCa, an important product formed in the fixation of atmospheric nitrogen by the so-called "cyanamid process." Calcium carbide is first produced by heating carbon and calcium at high temperatures in an electric furnace, and this compound is then heated under pressure with nitrogen obtained from the air. The crude product, known also as *Nitrolim*, is used as a fertilizer and undergoes decomposition in the soil with the production of cyanamid. The latter is then converted to urea, which is hydrolyzed to ammonium carbonate by organisms in the soil (*q. v.* **NITROGEN**).

CYANIDES, chemical compounds which contain the monad radical (CN)′, combined with a metallic element, as K (CN)′, potassium cyanide, or with a hydrocarbon radical, as CH_2. (CN) methyl cyanide. Cyanides can be obtained synthetically by heating a mixture of potassium carbonate and charcoal to redness in a porcelain tube, and passing nitrogen gas through the tube. Also formed when an organic body containing nitrogen is heated in a tube with metallic sodium. If cyanides are dissolved in water rendered alkaline by potash or soda, then a mixture of ferrous and ferric sulphates is added, and the mixture is rendered acid with dilute hydrochloric acid, a blue color of ferrocyanide of iron being formed. If the liquid containing a cyanide be made acid with a few drops of hydrochloric acid, and then a little yellow ammonium sulphide be added, and the liquid gently evaporated till the excess of sulphide is volatilized, the residue will give a red color when a few drops of tincture of iron are added. Cyanides give a curdy white precipitate with silver nitrate, which is insoluble in cold nitric acid, the dry precipitate, Ag(CN)′, when heated in a small glass tube, giving off cyanogen. Cyanides may be formed by dissolving metallic oxides or hydroxides in a solution of hydrocyanic acid, H.CN, also by double decomposition of metallic salts, with potassium cyanide if the resulting cyanide is insoluble.

CYANOGEN, dicyanogen, $(CN)_2$, or (N—C)—(C—N), or Cy_2. Obtained by heating silver or mercuric cyanide; also by dry distillation of ammonium oxalate. Cyanogen is a colorless poisonous gas which liquifies at —25°, or under a pressure of four atmospheres at 20°, and at —34° becomes crystalline. It burns with a peach-blossom-colored flame, forming CO_2 and nitrogen; water dissolves four volumes, and alcohol 23 volumes of the gas. Cyanogen is very poisonous, and smells like prussic acid. Cyanogen gas passed into strong aqueous hydrochloric acid is converted into oxamide. Cyanogen dissolves in an aqueous solution of potash, forming cyanide and isocyanate of potassium. Cyanogen can be regarded as the nitril of oxalic acid. Dry ammonia gas and cyanogen combine, forming hydrazulmin, $C_4N_6H_6$. Small quantities of cyanogen are formed during the distillation of coal. Potassium burns in cyanogen gas, forming potassium cyanide. Cyanogen was discovered by Gay-Lussac in 1815.

CYCLADES (sīk'la-dēz), the principal group of islands in the Grecian Archipelago now belonging to the Kingdom of Greece, so named from lying round the sacred island of Delos in a circle. The largest islands of the group are Andros, Paros, Myconos, Tenos, Naxos, Melos, and Thera or Santorin. They are of volcanic formation and generally mountainous. Some are very fertile, producing wine, olive-oil, and silk; others almost sterile. The inhabitants are excellent sailors. Pop. about 130,400.

CYCLAMEN, sowbread, a genus of *primulaceæ*, family *primulidæ*. The root of the same species is said to be eatable when dried or roasted.

CYCLES. See **BICYCLE**.

CYCLOMETER, an invention for measuring and recording the distance traveled by wheeled vehicles, extensively used in cycling. Its most important application is in railroading. The apparatus is connected with the wheels of a car, and by recording the number of revolutions tells on a sheet of paper inside the car the number of miles traveled. It is purely automatic, and in addition,

by an attachment of extreme beauty and ingenuity, every inequality in the road-bed of a railroad is detected and located.

CYCLONE, a circular or rotary storm or system of winds, varying from 50 to 500 miles in diameter, revolving round a center, which advances at a rate that may be as high as 40 miles an hour, and toward which the winds tend. Cyclones of greatest violence occur within the tropics, and they revolve in opposite directions in the two hemispheres—in the southern with, and in the northern against, the hands of a watch—in consequence of which, and the progression of the center, the strength of the storm in the northern hemisphere is greater on the S. of the line of progression and smaller on the N., than it would be if the center were stationary, the case being reversed in the southern hemisphere. An anticyclone is a storm of opposite character, the general tendency of the winds in it being away from the center, while it also shifts within comparatively small limits. Cyclones are preceded by a singular calm and a great fall of the barometer.

CYCLOPÆDIA, or **ENCYCLOPÆDIA**, in modern usage a work professing to give information in regard to the whole circle of human knowledge, or in regard to everything included within some particular scientific or conventional division of it. The character of such works has of necessity varied from generation to generation, with changing conceptions of the scope and value of our knowledge and of the mutual relations of one department with another.

Though several of the ancient philosophers of Greece, and notably Aristotle, carried their investigations into every department of inquiry within their intellectual horizon, none of them seems to have compiled exactly what we now call a cyclopædia. Speusippus, indeed, is credited with something of the sort; but his works exist only in fragments. The great Latin collections of Terentius Varro, dating from 30 B. C., and the so-called "Historia Naturalis" of the elder Pliny (23-79 A. D.), may thus be considered as the first specimens of their class. The 5th century saw the production of a curious and oddly written cyclopædia by Martianus Capella; in the 7th, Isidorus Hispalensis compiled his "Originum seu Etymologiarum libri xx," which was afterward abridged and recast by Hrabanus Maurus. Under the caliph of Bagdad, Alfarabius or Farabi, in the 10th century, wrote a cyclopædic work, "Ihsa Alulum"—remarkable for its grasp and completeness; but this has hitherto been left in manuscript (a fine copy is preserved in the Escurial). Vincent of Beauvais (Vincentius Bellovacensis), who probably died in 1264, gathered together, under the patronage of Louis IX. of France, the entire knowledge of the Middle Ages in three comprehensive works—"Speculum Historiale," "Speculum Naturale," and "Speculum Doctrinale," to which an unknown hand soon after added a "Speculum Morale." About the same time Brunetto Latini was engaged on his "Livres dou Tresor" (printed in Italian in 1474, and in the original French in "Documents inédits" (1680). The "De proprietatibus rerum" of Bartholomeus de Glanville deserves mention as being of English origin and highly successful in its day.

Written about 1360, this became exceedingly popular in the translation (1398) by John Trevisa. In 1541 the name cyclopædia is first used as the title of a book by Ringelberg of Basel, and in 1559 Paul Scalich styles his work "Encyclopædia seu orbis Disciplinarum tum Sacrarum tum Profanarium." Among the numerous cyclopædias of the 17th century it is enough to mention Antonio Zara's (Venice, 1615), and Alsted's (7 vols, fol. Herborn, 1630), both in Latin; Moreri's "Grand Dictionnaire Historique" (Lyons, 1674), which reached a 20th edition in 1759; Hofmann's "Lexicon Universale" (2 vols., fol. Basel, 1677; 4 vols. fol. Leyd. 1698), which was the first attempt to bring the whole body of science and art under the lexicographic form; Thomas Corneille's "Dictionnaire des Arts et des Sciences" (2 vols. Paris, 1694); and the most famous of all, Bayle's "Dictionnaire Historique et Critique" (4 vols. Rotterdam 1697), which was mainly designed as corrective and supplementary to Moreri.

It was in the course of the 17th century that the cyclopedists began regularly to employ the vulgar tongues for their work, and to arrange their material alphabetically for convenience of consultation. Of the vast "Bibliotheca Universale," planned by Coronelli to fill 45 folio volumes, only a small portion saw the light (Venice, 1701-1706). The series of great cycolpædic works in modern English practically began by the anonymous "Universal, Historical, Geographical, Chronological, and Classical Dictionary" (2 vols. 1703), and the "Lexicon Technicum" of Dr. John Harris (Lond. 1704). Ephraim Chambers followed in 1728 with his "Cyclopædia, or an Universal Dictionary of Arts and Sciences" (2 vols. fol.), which presents a distinct advance in the construction of such works, the author endeavoring to give to his alphabetically arranged materials something of the interest of a continuous

discourse by a system of cross references.

It was a French translation by John Mills of Chambers' "Cyclopædia" which originally formed the basis of that famous "Encyclopédie" which, becoming in the hands of D'Alembert and Diderot the organ of the most advanced and revolutionary opinions of the time, was the object of the most violent persecution by the conservative party in Church and State, and suffered egregious mutilations at the hands not only of hostile censors but of timorous printers. Appearing at Paris in 28 vols. between 1751 and 1772, it was followed by a supplement in 5 vols. (Amst. 1776-1777), and an analytical index in 2 vols. (Paris, 1780). Voltaire's "Questions sur l'Encyclopédie" (1770) was a kind of critical appendix. La Porte's "Esprit de l'Encyclopédie" (Paris, 1768), gave a résumé of the more important articles, and under the same title Hennequin compiled a similar epitome (Paris, 1822-1823). Numerous editions of the whole work, more or less expurgated or recast, were issued outside of France; and many minor encyclopædias, such as Macquer's "Dictionnaire Portatif des Arts et Métiers (1766), Barrow's "New and Universal Dictionary of Arts and Sciences" (1 vol. fol. 1753), and Croker, Williams, and Clerk's "Complete Dictionary of Arts and Sciences" (3 vols. fol. 1766), were to a considerable extent quarried out of their massive predecessor, or molded according to the method expounded by D'Alembert in his preliminary dissertation.

Between 1768 and 1771 there appeared at Edinburgh in 3 vols. 4to the first edition of the "Encyclopædia Britannica," which was from the beginning a kind of compromise between the alphabetical and the scientific distribution of subjects. Colin Macfarquhar, Andrew Bell, and William Smellie share the credit of the plan. Biographical and historical articles were first introduced in the 2d edition (10 vols. 4to 1776-1784). It was revised in 1907.

During the period that the "Encyclopædia Britannica" has been growing from edition to edition, numerous important encyclopædias have appeared in English —the "Edinburgh Encyclopædia" (18 vols. 1810-1830), edited by Sir David Brewster; Wilkes's "Encyclopædia Londinensis (24 vols. 4to. Lond. 1810-1829); "Encyclopædia Perthensis" (23 vols. Edin. 1816), a striking proof of the energy of its compilers, Aitchison of Edinburgh and Morison of Perth; the "Encyclopædia Metropolitana" (30 vols. 1818-1845), arranged, according to a philosophic plan by Coleridge, in four divisions: (1) pure sciences, (2) mixed and applied sciences, (3) biography and history, and (4) miscellaneous and lexicographic articles; the "Penny Cyclopædia" edited by Charles Knight for the Society for the Diffusion of Useful Knowledge (29 vols., 2 supplemental, 1833-1846); and the "English Cyclopædia" (22 vols. 1853-1861; a synoptical index, 1862; four supp. vols. 1869-1873), founded on the copyright of the "Penny Cyclopædia," but rearranged in four divisions—viz., geography, natural history, biography, and arts and sciences.

The cyclopædia now known as Brockhaus' "Conversations-Lexicon," which was started by Löbel at Leipsic, in 1796, and passed into the hands of F. A. Brockhaus in 1808, gave a great impetus to the production of similar works. It is still one of the most popular of German encyclopædias. Its principal rivals are Pierer's, and Meyer's "Konversations-Lexikon." The former (Altenburg, 1822-1836, 26 vols. with 14 supplemental vols. 1840-1856), which had somewhat fallen out of date, reappeared in 12 vols. in 1888-1893; while the latter has become in completeness and compression the best work of its kind (1st ed. 15 vols. Leop. 1857-1860), a striking characteristic being the free use made of maps, tabular conspectuses, woodcuts, and lithographic illustrations. The Brockhaus "Lexikon" became the basis, more or less entirely, of cyclopædias in most of the civilized languages of Europe—"Encyclopædia Española" (Madrid, 1848-1851); "Nuova Enciclopedia Popolare Italiana" (Turin, 1841-1851); "Nordisk Conversations-Lexikon (5 vols. Copenhagen, 1858-1863; 3d edition, 1883, etc.). Four English works were professedly founded on it—"Encyclopædia Americana" (14 vols. Phila. 1829-1846); "New American Cyclopædia" (16 vols. New York, 1858-1864), edited by Ripley and Dana, and frequently quoted as "Appleton's" from the name of the publisher; the "Popular Cyclopædia" (7 vols. Glasgow, new ed., 1883); and "Chambers' Encyclopædia" (10 vols. Edin., 1860-1868, edited by Dr. Andrew Findlater; new ed. 10 vols., edited by David Patrick, 1888-1892).

Other cyclopædias are: "Zell's Popular Encyclopædia" (3 vols. 8vo, Philadelphia, 1871); Colange, "National Encyclopædia" (New York, 1872, etc.); "American Dictionary and Cyclopedia" (10 vols. 8vo, New York and Chicago, 1900); "Johnson's Universal Cyclopædia" (4 vols. New York, 1874-1878; new ed. 8 vols. 1890-1895; 12 vols., 1900); New International Encyclopædia, revised in 1914 (22 vols.); "Imperial Reference Library" (6 vols. 8vo, Philadelphia, 1898); "Appleton's Cyclopædia of American Biography" (6 vols. 8vo, New York, 1885-1887); Heck and Baird, "Iconographic Encyclopædia" (4

vols., 2 vols. plates, New York, 1860); Brand and Cox, "Dict. of Science, Lit., and Art" (3 vols. 1865-1867; new ed., 1875); the "National Encyclopædia" (Lond., 1884, etc.); and Blackie's "Modern Cyclopædia" (8vo, Lond., 1889, etc.). Nor should we omit La.ousse, "Grand Dict. du XIX. siecle" (4to, Paris, 1878); Chevreuil, "Grand Dict. illustré" (4to, Paris, 1883); and Dreyfus, "La Grande Encyclopédie" (4to, 1885, etc.). Parry's "Encyclopædia Cambrensis" (1862-1863) is of interest.

An attempt to remedy the defect of protracted production has frequently led to the issue of supplemental volumes, planned so as to bring up the earlier articles to the same level as the later articles, in more than one instance, notably that of Brockhaus' and Meyer's "Konversations-Lexikon" and the New International Year Book.

In contrast with the larger cyclopædias may be mentioned the modern attempts to boil down the circles of the sciences into portable form. Thus Brockhaus issued a "Kleineres Conversations-Lexikon" (3 vols. Leip., 1854-1856; 4th ed. 2 vols. Leip,, 1885); Meyer's "Konversations-Lexikon" is admirably epitomized in Meyer's "Handlexikon" (5th ed. 3 vols. Leip., 1892-1893); and Spemann issues a pocket encyclopædia (Küschner's) which is a model of compression. Similar English productions are Beeton's "Encyclopædia" (2 vols. 8vo, Lond., *n. d.*); Beeton's "Dictionary of Science" (8vo, Lond., *n. d.*); Champlin's "Young Folks' Cyclopædia of Common Things" (New York, 1879), with the English reissue known as Cox's "Little Encyclopædia of Common Things" (8vo, Lond., 1882; 3d ed. 1884); Champlin's "Young Folks' Cyclopædia of Persons and Places" (1880); "Hazell's Annual" is a yearly cyclopædic record; Sampson Low's "Pocket Cyclopædia" (1889); Phillip's "Million of Facts" (8vo, 1836; and later without date); and in more recent years many others.

Special Cyclopædias.—This class has naturally become more and more numerous; though in many cases the works are neither designated cyclopædia nor dictionary. A valuable series is Meyer's "Fach-Lexika" (general history, ancient history, philosophy, geography, etc.), which applies the method of the "dictionary" to the treatment of individual subjects in separate volumes, thus differing from Lardner's "Cabinet Cyclopædia," and the "Encyclopædia Metropolitana," which were practically a series of treatises.

CYCLOPS, one of the people called cyclopes, alleged to be a savage race of one-eyed giants in Sicily. The caverns of Ætna were their smithy, and blacksmiths were looked on as their descendants.

CYDNUS (sĭd'nŭs), a river in Cilicia, rising in the Taurus Mountains, anciently celebrated for the clearness and coolness of its waters.

CYGNUS (the Swan), a large Northern constellation in the Milky Way, one of Ptolemy's original 48. It is surrounded by Draco, Cepheus, Lacerta, Pegasus, Vulpacula, and Lyra. One of its small stars of about the 5.5 magnitude, 61 Cygni, a well-known double as well, is one of our nearest neighbors among the stars. The determinations of its parallax are somewhat discordant, ranging from 0.27″ to 0.56″, giving in light-years a distance of from 12 to 6 years.

CYLINDER, a well-known solid whose cross-section at any point of its length gives always the same circle; or, mathematically, a solid generated by the revolution of a rectangle about one of its sides, which line is called the axis of the cylinder. That, the typical cylinder, is frequently called right, and if cut by two parallel planes not perpendicular to the axis the result is an oblique cylinder, with elliptical ends or sections. The term has also been generalized to include a solid generated by a line moving parallel to a fixed direction while tracing any fixed closed curve. In all cases the content of the cylinder is found by multiplying the number of square units in the base by the number of linear units in the altitude, which is the perpendicular distance between the two ends. The area of the convex surface is equal to the product of the circumference of the end, and the length of the generating line. To this must be added the areas of the two ends, to get the whole surface of the cylinder.

CYMBELINE, an ancient King of Great Britain in a very well-known play of Shakespeare called by his name. By his first wife he had a daughter, Imogen, who narried Posthumus Leonatus. His second wife had, by a former husband, a son named Cloten. Shakespeare borrowed the name from the half-historical Cunobelinus in Holinshed's "Chronicle," of whom several coins are extant.

CYMRI (kim'ri), a branch of the Celtic family of nations which appears to have succeeded the Gaels in the great migration of the Celts W., and to have driven the Gaelic branch to the W. (into Ireland and the Isle of Man) and to the N. (into the Highlands of Scotland), while they themselves occupied the S. parts of Great Britain. At a later period they were themselves driven out

of the Lowlands of Great Britain by the invasions of the Angles, Saxons, and Jutes, and compelled to take refuge in the mountainous regions of Wales, Cornwall, and the N. W. of England. Wales may now be regarded as the chief seat of the Cymri.

CYNANCHUM, a genus of *asclepiadaceæ*, of which some species have been used medicinally, as *C. monspeliacum*, as a violent purgative, the so-called montpellier scammony, and *C. vincetoricum*, formerly in repute as an antidote to other poisons. The Indian *C. extensum* yields fiber, and *C. ovalifolium* of Penang, caoutchouc.

CYNEWULF (kin'e-wulf), an Anglo-Saxon or early English poet, whose name we only know from its being given in runes in the poems attributed to him, viz., "Elene" (Helena), the legend of the discovery of the true cross; "Juliana," the story of the martyr of that name; and "Crist" (Christ), a long poem incomplete at the beginning. The name Cynewulf also occurs as the solution of one of the metrical riddles in the Anglo-Saxon collection. Cynewulf probably lived in the first half of the 8th century.

CYNICS, a sect of philosophers among the Greeks, so called from their snarling humor, and their disregard of the conventional usages of society; the name being probably derived from the *kyōn*, a dog. According to some authorities, however, cynic is formed from Cynesarges, the name of the gymnasium in which the founder expounded his system. He taught that the true dignity of man consists in wisdom, and wisdom in independence of mind; that pain and labor, and even infamy, are benefits; and that pleasure, on the contrary, is an evil. His doctrine of the supreme good is a life according to virtue, which consists in action. He condemned all civil institutions, despised the ties of kin or country, and saw in wedlock no higher or better end than the propagation of the species. The most famous of the Cynics, besides their founder, were Diogenes of Sinope, Crates of Thebes with his wife Hipparchia, and Menippus. At length the sect became so disgusting from their impudence, dirty habits, and profligacy, that they ceased to be regarded with any respect, and passed into obscurity. The great merit of this system is that it paved the way for the establishment of Stoicism.

CYPRESS, a tree, *Cupressus sempervirens*, a tall evergreen conifer, indigenous to Persia and the Levant, but planted all over the adjacent regions. The Greek word *kyparissos* has by some been derived from *Kypros*, the island of Cyprus, where it is abundant. It is planted, in the regions where it grows, in burial grounds, especially in those of the Mohammedans and of the Armenians. The Greeks made their coffins of its wood, and some Egyptian mummy chests are of the same material. It is used in Candia, Malta, and other places for building purposes, being very durable. The doors of St. Peter's at Rome are formed of it, and have lasted 1,100 years. Cabinet-makers and turners find it suitable for their respective crafts. In recent years it has gained favor in the United States for building purposes.

CYPRIAN, ST., THAECIUS CÆCILIUS (sip'rē-an), Bishop of Carthage, and one of the fathers of the Church. He was probably a native of Carthage, taught rhetoric there, and about 246, when nearly 50 years of age, was converted to the Christian faith. He adopted a rigidly ascetic manner of life, and was appointed Bishop of Carthage in 248. When the persecution under Decius fell on the Churches, Cyprian ran away and concealed himself for nearly two years. He was then received as bishop again, but during the next persecution, under Valerianus, he was arrested and banished. After a year he was recalled, but as he refused to make the required sacrifice to the gods, he was put to death, 258. His works, consisting of letters and sermons, are of great importance for the insight they give into the beliefs, modes of thought, and practices of the early Churches.

CYPRUS, an island lying on the S. of Asia Minor, and the most easterly in the Mediterranean. Its greatest length is 145 miles, maximum breadth about 60 miles; area, 3,584 square miles. The chief features of its surface are two mountain ranges, both stretching E. and W., the one running close to the N. shore, and extending through the long N. E. horn or prolongation of the island, the other and more massive (Mount Olympus) occupying a great part of the S. of the island, and rising in Troödos to 6,590 feet. Between them is the bare and mostly uncultivated plain called Messaria. There is a deficiency of water. The climate is in general healthy. The mountains are covered with forests of excellent timber (now under government supervision), and the island is esteemed one of the richest and most fertile in the Levant. Wheat, barley, cotton, tobacco, olives, raisins, and carobs are the most important vegetable products. The wine is famous. Silk-worms

are reared, and a coarse kind of silk is woven. Salt in large quantities is produced. The minerals are valuable; the copper mines were of great importance in ancient times (the name copper is derived from that of this island), and are again being worked. Large numbers of sheep and goats are reared on the extensive pasture lands of the island. The principal towns are Lefkosia or Nicosia, the capital, the only considerable inland town, and the seaports Larnaca and Limassol. The chief exports are carobs, wine, and cotton, with cheese, raisins, cocoons, wool, etc.

After belonging successively to the Phœnicians, Greeks, Egypt, Persia, and again Egypt, Cyprus in 57 B. C. became a Roman province, and passed as such to the E. division of the empire. In 1191 it was bestowed by Richard of England (who had conquered it when engaged in the third crusade) on Guy de Lusignan, and after his line was extinct, it fell into the hands of the Venetians (1489), with whom it remained till it was conquered by the Turks in 1571 and annexed to the Ottoman Empire. In 1878 it was ceded to Great Britain by the convention of Constantinople concluded between England and Turkey. The island has become much more prosperous under British administration, and roads, harbor-works, etc., have been constructed, trees planted, and schools opened. The head of the government is the chief-commissioner, and there is a legislative council. Great Britain annexed the island in November 1914. Over three-fourths are Greeks, the rest Mohammedans. Pop. (1919) 311,108. Capital, Nicosia (pop. 16,632).

CYRENAICS, or **CYRENIANS**, a sect of ancient philosophers, whose founder, like that of the Cynics, had been a disciple of Socrates, being Aristippus, a native of Cyrene, in Africa, after which city his followers were called. His great maxim was that a man ought to control circumstances, and not be controlled by them. According to him, the sum of life was made up of pleasure and pain; the one to be sought after as good, the other to be avoided as evil. The chief good, according to him, was the greatest number of agreeable perceptions; and the true philosopher was one who actively and successfully pursued pleasure. The chief successors of Aristippus were Theodorus, Hegesias, and Anniceris, each of whom became the founder of a sect known respectively as the Theodoran, Hegesian, and Annicerian schools. As cynicism was the forerunner of stoicism, so cyrenaicism likewise paved the way for epicureanism, which constitutes its chief merit.

CYRENE, the capital of Cyrenaica, was founded by Battus and his followers from Thera, 631 B. C. Seven kings of this race succeeded, and about 450 B. C. a republic was established. It was afterward made subject to Egypt, and passed under the dominion of Rome, 74 B. C. The ruins of this town, called Ghrennah by the Turks, still exist, in a beautiful and fertile plain, about 11 miles from the Mediterranean Sea, and attest its former magnificence. It was the birthplace of many great men, among whom were Callimachus, Eratosthenes, Carneades, and Aristippus.

CYRIL, the name of three saints or fathers of the Christian Church.

Cyril of Jerusalem, born there about A. D. 315, was ordained presbyter in 345; and in 350 or 351 became Patriarch of Jerusalem. He engaged in a warm controversy with Acacius, the Arian Bishop of Cæsarea, by whose artifices he was more than once deposed from his episcopal dignity. He died in 386 or 388. There are extant some writings composed by him.

Cyril of Alexandria was educated by his uncle Theophilus, Patriarch of Alexandria, and in A. D. 412 succeeded him as Patriarch. In this position his ambitious spirit brought the Christians into violent quarrels. At the head of the populace he assailed the Jews, destroyed their houses and drove them out of the city. Orestes, the prefect, having complained of such violence, was attacked by 500 furious monks. The assassination of Hypatia took place, it is said, at his instigation. His quarrel with Nestorius and with John, Patriarch of Antioch, regarding the two-fold nature of Christ, convulsed the Church, and much blood was shed between the rival factions at the Council of Ephesus in 431, the emperor having at last to send troops to disperse them. Cyril closed his restless career in 444.

St. Cyril, "the Apostle of the Slavs," a native of Thessalonica. He converted the Chazars, a people of Hunnish stock, and the Bulgarians, about A. D. 860. He died about 868. He was the inventor of the Cyrillian Letters, which took their name from him, and is probably the author of the Apologies which bear his name.

CYRUS, surnamed THE ELDER, founder of the Persian monarchy, was son of Cambyses, a Persian noble, and of Mandane, daughter of Astyages, king of Media. The principal exploits attributed to him are the incitement to a revolt of

the Persians and consequent defeat of Astyages and the Medes, when he became king, 559 B. C.; the conquest of Lydia and capture of Crœsus; the siege and capture of Babylon in 538, and the invasion of Scythia, where he was defeated and slain by Tomyris, queen of the Massagetæ, 529. He was interred at Psargardæ.

CYRUS, surnamed THE YOUNGER, was son of Darius II., King of Persia, and Parysatis. In 407 B. C. he was made governor of the western provinces of Asia Minor. He was of ambitious temper, and was sentenced to death for plotting against his brother Artaxerxes on his accession to the throne, but was pardoned. Still determined to be king himself, he raised an army, including a large body of Greek mercenaries, crossed the Taurus, marched down the Euphrates, and at Cunaxa encountered the army of his brother, when he was defeated and slain, 401 B. C. Xenophon, who had served as a volunteer among the Greeks, conducted their retreat, and wrote an account of the expedition.

CYST (a bladder), a word sometimes used in the original sense as applied to hollow organs with thin walls, as the urinary bladder and gall-bladder; but commonly reserved for the designation of pathological structures or new formations within the body having the bladder form. Cysts may arise in two different ways: (1) either by the accumulation of products within cavities normally present, or (2) by the independent formation of a cavity. Of the first, wens, collections of secretion in a sebaceous gland of the skin, are the commonest example; instances of the second are cystic tumors of the ovary, and the sacs developed in connection with certain parasites. They are either simple or compound, unilocular or multilocular; they are sometimes small; in other cases they grow to an enormous size, and are very complex.

CYSTITIS, inflammation of the bladder.

CYSTOIDEA, an order of extinct *echinoderms*. They are spherodial animals. They have a mouth above; the arms are rudimentary. Von Buch first elucidated their structure and affinities at Berlin in 1845, and gave them the name of cystideæ in place of sphæronites; their original appellation. Now cystideæ has become cystoidea. They range from Upper Cambrian to the Silurian, being especially prominent in the Bala Limestone.

CYTHERE, a genus of *entomostraca*, order *Ostracoda*, family *cytheridæ*. The eye is single, the inferior antennæ setigerous, but without a tuft or pencil of tiny filaments; three pairs of feet inclosed within the shell. No heart present.

CYTHEREA (from Cytherea, a name for Venus, so called because she is said to have sprung from the foam of the sea near Cythera, now Cerigo, an island on the S. E. of the Morea), a genus of conchiferous mollusks belonging to the family *veneridæ*. The shell is like that of the genus Venus. The cythereas are in all seas; 176 recent species are known, and 200 fossil, the latter ranging from the Oölite till now.

CYTHERIDÆ, a family of entomostracous crustaceans, of which cythere is the type.

CYTHERON, a shepherd of Bœotia, changed by Jupiter into a mountain near Thebes.

CYTISUS, a genus of plants belonging to the natural order *Leguminosæ*, sub-order *Papilionaceæ*. The members of the genus are shrubs or small trees, sometimes spiny, with leaves composed of three leaflets, and with yellow, purple, or white flowers. They belong to Europe, Asia, and North Africa, and are very ornamental plants. The best known species is the common laburnum (*C. Laburnum;* see LABURNUM). Another species is the Alpine laburnum (*C. alpinus*). The common broom (*C. Scoparius*) also belongs to this genus.

CYZICUS, a peninsula of Asia Minor, 70 miles S. W. of Constantinople. It was once an island, and the site of an ancient town of the same name.

CZAR, a king; formerly the title of the Emperor of Russia. It was first assumed by Ivan IV., in 1547.

CZAREVNA, the title of the wife of the former czarowitz.

CZARINA, formerly the wife of an Emperor of Russia.

CZAROWITZ, CZAREVITCH, or **CZAREWITCH**, the title of the oldest son of the former Emperor of Russia.

CZECHO-SLOVAKIA, REPUBLIC OF, composed of the former Austrian states of Bohemia, Moravia, the larger part of Silesia, and Slovakia, formerly a part of the Kingdom of Hungary. Bohemia has an area of 20,065 square miles, with a population of about 6,700,000; Moravia 8,584 square miles, with a population of about 2,600,000; Silesia 1,988 square miles, with a population of about 757,000; and Slovakia about 25,000 square

miles, with a population estimated in 1919 at between 3,000,000 and 4,000,000. In all these countries the population is of the Slavic race, though in Bohemia there is a large proportion of Germans. The Czech, or Bohemians, are by far the most important of these various peoples, both in numbers and culture, and are now the dominant political element. The capital of the Republic is in the Bohemian city of Prague, whose population is about 550,000. In culture and the educational level of its people it ranks with the most progressive cities of Europe, having two universities, one Bohemian, the other German. In the whole of the Bohemian population the percentage of illiteracy is only 2 per cent. Another important city is Pressburg, in Slovakia, also the site of a modern university. Slovakia, of a much lower cultural level, is inhabited by an agricultural people, of simple manners and a lower standard of living.

The frontiers of the Republic, though not definitely agreed upon in the beginning of 1920, were roughly as follows: Hungary on the N., on the W., Hungary to the Danube, along the Danube to the outlet of Eipel, along the Eipel to Zombat, thence to the mouth of the Ung river, along the Ung to the Uzsok Heights.

The Czechs, or Bohemians, had behind them a history as a free people to inspire their struggles for independence in modern times. Bohemia had been an independent kingdom in the Middle Ages, becoming a part of the Austrian Empire in 1526. The Slovaks, who, in the 9th century, formed the nucleus of the great Moravian kingdom, were subjugated by the Magyars in 907, after the bloody Battle of Pressburg, and have been very much oppressed by the Hungarian kings.

In recent times the movement for independence was most strongly organized among the Czechs. For many years there existed among them a secret revolutionary organization, popularly known as the Mafia, the name being taken from the well-known Sicilian order of the same name. At the head of this underground movement was Dr. Szamal, and Dr. Voita Benes, the latter now a prominent member of the official government. Little is known of the activities of the Mafia because of the secrecy with which they were carried on, no one member knowing more than two of his comrades, but it was famous for the perfection of its intelligence system, its spies being installed even in the imperial household and in all the offices of the Cabinet ministers.

With the outbreak of the World War, in 1914, the movement for Czech national independence began to manifest itself in the open. A National Council appeared shortly afterward in Paris and sought recognition from the Entente nations and the United States. That the people of both Bohemia and Slovakia stood squarely behind the movement became only too evident to the Austrian Government, from the behavior of the Czech and Slovak contingents that were sent to the front. At first they were sent to the eastern front, against the Russians. In at least several instances the Austrian defeats were due to the wholesale defection of the Czechs and Slovaks. On one occasion a whole regiment marched out of the Austrian trenches, with the regimental band playing a revolutionary march, and joined the Russians. So common became these desertions that finally the Czech and Slovak contingents were sent to the Italian front, where they were placed in positions entailing heaviest losses. To these losses the Austrian Government afterward pointed as proof of the loyalty of the Czech and Slovak troops. But throughout the war the disloyalty of these elements in the Austrian forces was a continuous source of military weakness, and accounted for their vast inferiority to the Germans.

The attention of the public of the Allied countries was first attracted to the national aspirations of the Czecho-Slovaks when, after the Russian disintegration following the Revolution (March, 1917), the Czech and Slovak contingents which had deserted on the eastern front suddenly emerged as the only remaining cohesive force in the Russian Army. They formed the backbone of the July offensive, which represented the last effort of the Kerensky Government to carry on the Russian operations against the Central Empires, but were not strong enough to make a success of this vast effort. Later, after the downfall of Kerensky's moderate Socialist Government, the Czecho-Slovaks refused to join the Bolsheviki and received permission from the latter to make their way to western Europe through Siberia. Regretting this promise, the Bolsheviki endeavored to disarm the Czecho-Slovaks en route, whereupon the latter, asserting themselves, turned upon the Bolsheviki and succeeded in driving them out of a greater part of Siberia, and thus formed the backbone of the subsequent intervention of the Allies in Russia.

The brilliant exploit of the Czecho-Slovaks in Siberia attracted world-wide attention to them, and led to official recognition of their movement for independence by the Allies and the United

States. On Dec. 10, 1917, Premier Clemenceau of France authorized the formation of a distinct Czecho-Slovak army in France, to co-operate with the Allies on the western front. On April 23, 1918, the Italian Government formally recognized the belligerency of the Czecho-Slovak nation; British recognition followed, on Aug. 3, 1918, that of the United States was announced on Sept. 2, 1918, and that of Japan on Sept. 9, 1918. But already on May 29, 1918, Secretary Lansing, representing the United States, announced officially that "the national aspirations of the Czecho-Slovaks and Jugoslavs for freedom have the earnest sympathy of the United States." In the following June the United States Government officially permitted the Czecho-Slovak representatives in this country to recruit men for a Slavic legion.

Early in April, 1918, after the disintegration of the Austro-Hungarian Empire was well under way, popular demonstrations for independence took place in Prague. So widespread were these disorders that a state of siege was proclaimed by the Austrian authorities and many of the popular leaders were executed. On Oct. 21, 1918, the independence of the Czecho-Slovak peoples was officially proclaimed by the National Council; a general uprising took place in Prague and the city passed almost bloodlessly out of the nerveless hands of its Austrian rulers. On Oct. 28, a week later, a provisional government was organized and installed in Prague. On Nov. 2, 1918, the leaders of the revolution met in Geneva, Switzerland, and drafted a system of organic laws for the new republic, which included equal suffrage for the sexes and referendum voting for all important legislation. On Nov. 10 a provisional National Assembly met in Prague and elected the first President of the Republic, the honor falling to the prominent Czech scholar and historian, Thomas Garrigue Masaryk, who was then in the United States on a diplomatic mission. On Dec. 22, 1918, the new President was officially inaugurated into office in Prague, together with his Cabinet, the Prime Minister of which was Dr. Karl Kramarz, with the prominent revolutionary leader, Voita Benes, as Minister of Foreign Affairs.

The new government was based on constitutional provisions as liberal as those of the most liberal governments of the world, being largely modeled after the principles of the Constitution of the United States. These included the complete freedom of religious worship, freedom of the press, speech, petition, the right of assembly, the separation of state and church; universal suffrage, including women, the national representation of minorities and proportional representation. The new National Assembly, which was to remain in power until proper popular elections could be held, was composed of 260 members. The following parties were represented: Agrarians, the peasants' party, 54; Social Democrats, 50; Slovaks, 50; State-Right Democrats, a moderate Liberal party, 44; Socialists, 28; Clericals, 28; and Progressives, representing a liberal middle class element, 6.

The newly organized government of the Czecho-Slovak Republic had tremendous difficulties to face from the very moment it took up its task of administration. First of all Austria had been the heaviest sufferer from the war, economically considered. Supplies of foodstuffs were almost completely depleted, not only in Czecho-Slovakia, but in the neighboring countries as well. The deterioration of the railroads and their rolling stock had reached a point where they had almost ceased to operate, nor did the new state have any opening to the sea. Of railroad lines there were 13,000 kilometers in the countries, including a main line running through Prague from northern Europe down to the Balkans and Constantinople. Thus, the possibilities of future development of transportation were given. Furthermore, the territory of the Republic held within it excellent resources. Before the war its cotton output had been 85 per cent. of that of the whole Austrian Empire; its wool production had been 95 per cent. of the total; its metal production 70 per cent., and 50 per cent. of motor transport vehicles in the Austrian Empire had been manufactured in Bohemia. Thus the plants for production were there, and had only to be worked, as soon as the raw materials could be procured.

As in all countries which had suffered severely, there was in Czecho-Slovakia a strong radical sentiment among the working classes. In the neighboring state of Hungary this finally culminated in the ascent into power of a purely Bolshevist government. This same element was a powerful tendency toward disintegration in Czecho-Slovakia as well, but there it was fought more successfully. On Jan. 11, 1919, an attempt was made by the Bolsheviki, or Communists, to assassinate the Premier, Dr. Kramarz, largely on account of his declaration of policy in favor of retaining the big landed estates intact. The attempt failed, and aroused strong popular sentiment against the minor Communist elements, but nevertheless

the conservative policy of the Premier proved unpopular among the representatives of the people as a whole. In July, 1919, Kramarz and his Cabinet resigned in favor of the Socialists, who established a new government, with Vlastimil Tusar as Premier, Dr. Benes remaining as Foreign Minister. The Social Democrats and the Agrarians remained the dominating parties, the first leading. This change was fully ratified by the popular elections, which took place at this time in Bohemia. On Oct. 28, 1919, President Masaryk made a memorable speech before the national Assembly, in which he formulated the policies of the Government. He expressed himself very strongly against Bolshevism, considering it only the frantic remedy of a desperate people beset by economic ills that had become unbearable, but at the same time, he declared, the Government would countenance no policy of intervention either in Russia or Hungary, and Czecho-Slovakia would, therefore, not join in any of the Allied efforts in that direction. He proclaimed the Government's policy to be that of peaceful evolution toward high ideals, which might eventually demand many radical changes, but these must be brought about gradually and without bloodshed. He was convinced that the ideals of the Bolsheviki were not at fault; he deplored only their methods. For his Government also had as its ultimate ideal the socialization of the big industries. He plainly enunciated a moderate socialist program, a startling fact, since the President had never before been associated with Socialistic principles. "This policy," he said, finally, "may be termed crass materialism, but the materialism of the hungry is worthy of more consideration than the materialism of the overfed." The words of its chief executive plainly indicated that Czecho-Slovakia had joined those nations which have definitely set out on the path toward political Socialism.

During the first year the Czecho-Slovak Government had already begun the formation of a strong national army. This was later augmented by the seasoned troops which arrived in small contingents from Siberia. Already, before the frontiers of the Republic had been definitely fixed by the international boundary commissions of the Paris Peace Conference there developed difficulties with the neighboring states of Poland and Hungary, which on several occasions culminated in actual hostilities and military operations. In January, 1919, there had been serious operations against the Poles in western Galicia, over the Teschen district, which was still disputed territory important on account of its valuable coal deposits and the sovereignty of which was still to be decided by plebiscite. A month later the Czecho-Slovak troops advanced against the forces of the Hungarian Communist Government, and open warfare continued until July, when the Czecho-Slovaks were badly defeated, and were only saved from disaster by the action of the Peace Conference, in Paris, which intervened in their behalf. Great satisfaction was felt throughout the Republic when the publication of the Peace Treaty between the Allies and Germany announced the provisions in favor of Czecho-Slovakia. By its terms it was assured of an economic outlet to the Adriatic, special rights being granted in the matter of railroad transportation to Fiume and Trieste. Furthermore, Germany was also bound to lease to Czecho-Slovakia, for a period of 99 years, terminal and shipping space in Hamburg and Stettin, the details of which were to be worked out by a special commission on which Germany, Great Britain, and Czecho-Slovakia were to be equally represented. A favorable outcome of the Teschen dispute with Poland was also obtained when, in August, 1920, the Council of Ambassadors in Paris, which had been arbitrating the difficulty, awarded Czecho-Slovakia the western district of the territory in question, containing the coal mines, Poland being awarded the city of Teschen.

In July, 1920, the popularly elected National Assembly was installed, the First National Assembly being dissolved in April. The legislative body consisted of two chambers; a Senate, of 150 members, and the Chamber of Deputies, of 300 members, the members of the former being elected for eight years and the members of the latter for six years. The preponderance of power is, however, with the lower house, the Senate having little more than the veto power. At the same time President Masaryk was re-elected to office for a term of seven years. Following this there was a reorganization of the Cabinet, formal rather than real, since the personnel of the Cabinet remained practically the same, the Social Democrats and Agrarians retaining their power. Signs of future stability were in evidence, for while food was still scarce in the larger cities in 1920, on account of poor railroad transportation, the crops of 1919 had been unusually good, and those of 1920 promised to be equally abundant. In his speech before the National Assembly, after his election, the President

again emphasized the socialistic ideals of the government and the desire to accomplish this peacefully, not only within the Republic, but through peaceful relations with all other nations.

CZECHS (chegs), the extreme W. branch of the great Slavonic family of races. The Czechs have their headquarters in Bohemia, where they arrived in the 5th century. The origin of the name is unknown. They speak a Slavonic dialect of great antiquity and of high scientific cultivation. The Czech language is distinguished as highly inflectional, with great facility for forming derivatives, frequentatives, inceptives, and diminutives of all kinds. Like the Greek it has a dual number, and its manifold declensions, tenses, and participial formations, with their subtle shades of distinction, give the language a complex grammatical structure. The alphabet consists of 42 letters, expressing a great variety of sounds. In musical value the Czech comes next to Italian. See CZECHO-SLOVAKIA.

CZENSTOCHAU, or **CZENSTOCHOWA** (chens'to-gou), a town of Poland, 148 miles S. W. of Warsaw by rail. A Catholic monastery, founded here about 1382, is visited yearly by 50,000 to 60,000 pilgrims, as possessing the famous "Black Virgin," a murky painting of Byzantine origin, but ascribed by legend to St. Luke himself. In 1655 Czenstochau was the only place in Poland which offered resistance to Charles Gustavus of Sweden, when 70 monks and 150 soldiers for 38 days held out against 10,000 men. The inhabitants, about 18,000, carry on a considerable trade in sacred pictures and rosaries.

CZENMAK, JOHN NEPUMUK, a German physiologist and physician; born in Prague, June 17, 1828; Professor of Physiology at Jena. He was the inventor and introducer of the laryngoscope and rhinoscope, and of a new method for the therapeutical and surgical treatment of diseases of the epiglottis and throat. His work on the laryngoscope has been translated and published in several languages. He died Sept. 16, 1873.

CZERNIN VON CHUDENITZ, COUNT OTTOKAR, Austrian statesman, was Austro-Hungarian ambassador to Rumania in 1914, when the World War broke out, and for some time after. The entry of Italy into the war on the side of the Allies having discredited Burian, the Foreign Minister, who had carried on the negotiations with Italy, he was forced to resign, Dec. 23, 1916, whereupon Count Czernin was appointed to his place. Czernin represented Austria-Hungary in the negotiations with Bolshevist Russia, preceding the Brest-Litovsk Treaty. He resigned on April 15, 1918, being involved in the scandal resulting from a letter written by the Emperor himself to his brother-in-law, Prince Sixtus of Bourbon, through whom it was proposed to effect a peace with the Allies at Germany's cost.

CZERNOWITZ, the capital of the former Austrian province of Bukowina; stands 720 feet above sea-level, near the right bank of the Pruth, 165 miles S. E. of Lemberg. Among its buildings are the palace of a Greek archbishop (1875); his cathedral (1864), on the model of St. Isaac's at St. Petersburg; the Armenian church (1875); the synagogue (1877); and the "Austria Monument" (1875). The university here was founded in 1875. The manufactures and trade previous to the World War, during which the town and its vicinity saw much severe fighting, were steadily developing. Pop. about 90,000.

CZERNY (cher'nē), **GEORGE**, Hospodar of Servia; born in the neighborhood of Belgrade about 1770. His true name was George Petrovitch, but he was called Czerny or Kara George, *i. e.*, Black George. In 1801 he organized an insurrection of his countrymen against the Turks, took Belgrade, and forced the Porte to recognize him as Hospodar of Servia. In 1813, however, he had to retire before a superior force, and took refuge in Austria. Returning to his country in 1817, he was taken and put to death in July.

CZOLGOSZ, LEON, an American assassin; born about 1874, of Polish-German ancestry; worked at various trades in the United States and became affiliated with anarchists through the teachings of EMMA GOLDMAN (*q. v.*). On Sept. 6, 1901, while President McKinley was holding a public reception at the Pan-American Exposition in Buffalo, N. Y., Czolgosz treacherously shot him twice. On Sept. 14, the President died; on Sept. 23 Czolgosz was brought to trial; on the 26th was sentenced to death, and was electrocuted in the prison of Auburn, N. Y., Oct. 29, 1901.

D

D, d, the fourth letter and the third consonant in the English alphabet. It represents a dental sound formed by placing the tip of the tongue against the roots of the upper teeth, and then passing up vocalized breath into the mouth. It is always sounded in English words. though frequently slurred over in rapid speech in such words as handkerchief. After a nonvocal or surd consonnant it takes a sharper sound, nearly approaching that of t, especially in the past tenses and past participles of verbs in -ed.

D. As an initial is used:

1. In chronology, for *Domini*, genit. sing. of Lat. *Dominus*=Lord, as A. D. =*Anno Domini*=in the year of our Lord.

2. In music, as an abbreviation for *Discantus, Dessus, Destra*, etc. .

3. In university degrees, etc., for Doctor, as M. D. = Doctor of Medicine; D. D. = Doctor of Divinity, etc.

D. As a symbol is used:

1. In numerals, for 500. Thus DC= 600; DL=550. When a dash or stroke is written over the letter its value is increased tenfold. *i. e.*, to 5,000.

2. In chemistry, for the element didymium.

3. In music.

(1) For the first note of the Phrygian, afterward called the Dorian mode.

(2) For the second note of the normal scale of C, corresponding to the Italian *re*.

(3) For the major scale having two sharps and for the minor scale having one flat in its signature.

(4) For a string tuned to D, *e. g.*, the third string of the violin, the second of the viola and violoncello.

(5) For a clef in old mensurable music, *D. excellens*.

(6) D is used for *doh* in the tonic sol-fa system.

4. In commerce, for English penny or pence, as £ s. d.=pounds, shillings, and pence.

D'ABERNON, EDGAR VINCENT, BARON. He was born in 1857, and was educated at Eton. In 1877 he passed the examination for Student Dragoman at Constantinople; joined Coldstream Guards from which he resigned, as lieutenant, in 1882. He became secretary to Lord Fitzmaurice, Commissioner for Eastern Rumelia, in 1880; assistant to Commissioner for Evacuation of Territory ceded to Greece by Turkey, 1881; representative on Council of Ottoman Public Debt, Constantinople, 1882; President of Council of Ottoman Public Debt, 1883; Financial Adviser to Egyptian Government, 1883-1889; governor of Imperial Ottoman Bank, 1889-1897; and Conservative member of Parliament 1899-1906. He wrote: "Alcohol—its Action on the Human Organism."

DABNEY, CHARLES WILLIAM, an American consular officer; born in Alexandria, Va., March 19, 1794. He was made United States consul in the Azores in 1826, and by his services to the people of the islands made his name a household word among them. He died in Fayal, Azores, March 12, 1871.

DABNEY, CHARLES WILLIAM, an American scientist and educator; born in Hampden-Sidney, Va., June 19, 1855. He was educated at Hampden-Sidney College and at the Universities of Virginia, Berlin, and Göttingen. In 1877 he became Professor of Chemistry in Henry and Emory College, and in 1880 was appointed state chemist of North Carolina. He was president of the University of Tennessee 1887-1904 and became president of the University of Cincinnati in 1904. From 1893 to 1896 he was Assistant Secretary of Agriculture. He also served on many boards and commissions, was a member of several scientic societies, and published numerous scientific works.

DABO, LEON, an American mural and landscape painter. Born in Detroit

in 1869, he studied in France, Spain, and Italy. After executing some mural paintings for churches in New York he turned his attention to landscape painting, in which field he did nearly all his best work. His favorite subject was the Hudson, and the shores of Staten Island. Among his important creations were: "Nocturnal Fêtes on the Hudson," "Dawn beyond the Hudson," and "The Rocket." His work is represented in many public and private galleries both in the United States and abroad.

DACCA, a city of Bengal, in the division and district of the same name, 150 miles N. E. of Calcutta; on the N. bank of the Buriganga; occupies an area of 8 square miles, and consists of a dull esplanade and one long street meeting at right angles, with a complementary network of narrow, crooked lanes. Its position commands the principal waterways of the delta, and it thus enjoys singular facilities in the way of inland navigation. On this account it was chosen, about 1610, as the seat of the Mohammedan government of Bengal, which rank it retained, except during an interval of 20 years, until 1704. The suburbs extended 15 miles N., where mosques and brick buildings are still found buried in thick jungle. In the 18th century it became widely celebrated for the delicate texture of its muslins, and in connection with this manufacture the French and the Dutch, as well as the English, had extensive establishments in the place. After 1817, however, the annual value of the trade declined, and the aspect of the city changed with the disastrous decay of its staple industry. Since 1872 the fortunes of Dacca have somewhat brightened; the general development of trade throughout the presidency has brought back a share of its former prosperity, and the opening of the Dacca and Maimansingh State Railway in 1886 notably increased the transit trade. Besides the Dacca College (1835), there are many good schools, and a fine hospital; in 1878 a system of water-works was opened, and the sanitary condition has since improved. Pop. about 125,000.

DACHSHUND (däks'hönt), a name adopted from the German, signifying "badger-dog." The dachshund has been common in Germany for many years, but was unknown in England until introduced by the late Prince Consort toward the middle of the 19th century; it then became very fashionable and popular. The dachshund is a small dog, weighing about 20 pounds, with short crooked forelegs, and an extremely long body, its head rather resembling that of a miniature bloodhound. Its strong, large paws enable it to dig rapidly. Its color should be black and tan, or brown.

DACIA (dā'shya), a large tract of the Roman empire beyond the Danube; now comprising Moldavia, Wallachia, and portions of Transylvania and Hungary. Prior to Constantine the Great, the whole tract was divided into Trojan Dacia and Aurelian Dacia. The former, or Dacia proper, was situated N., the latter S., of the Danube. The country was inhabited by the Daci or Dacæ, a warlike nation of German origin, who, after a heroic resistance, continued for upward of 75 years, were finally conquered by Trajan (A. D. 105) whereupon the entire region became a Roman province. In 270-275 the Romans abandoned the country to the Goths. In 453, Ardaric, King of the Gepidæ, seized the country, and in 566 it was conquered by a colony of Scythians.

DA COSTA, JACOB MENDEZ, an American physician and educator; born in St. Thomas, W. I., Feb. 7, 1833. He was graduated at Jefferson Medical College in 1852, practicing in Philadelphia. In 1863 he became Lecturer in Jefferson Medical College, in 1872 Professor of the Theory and Practice of Medicine there, and in 1891 Professor Emeritus. In 1895 he was chosen president of the College of Physicians and Surgeons in Philadelphia. He wrote "Harvey and his Discovery," "Medical Diagnosis," etc. He died in 1900.

DÆDALUS (dē'da-lus or ded'a-lus), a figure in Greek mythology who personified the beginning of the arts of sculpture and architecture. He was of the old Athenian royal race of the Erechtheidæ. Having killed his nephew and pupil in envy at his growing skill, he had to flee to Crete where he made the well-known cow for Queen Pasiphaë, and afterward for King Minos the famous labyrinth to confine the Minotaur. Minos next imprisoned Dædalus, but he escaped with the help of Pasiphaë, and formed wings for himself and his son Icarus, with which to fly across the sea. He himself flew safe across the Ægean, but unhappily Icarus flew too near the sun, the heat of which melted the wax that fastened his wings to him, so that he dropped into the sea, and left his name to be borne by that part of the Ægean into which he fell. Dædalus made his way to Sicily. Some accounts made him first alight at Cumæ in Italy, where he dedicated his wings to Apollo. Works of art were freely ascribed to Dædalus in Greece, Italy, Libya, and the Mediterranean islands. The name Dædala was applied to the earlier painted and gilded wooden statues of the gods.

DAFFODIL, the popular name of a European plant which is one of the earliest ornaments of our gardens, being favorite objects of cultivation. It belongs to the order *Amaryllidaceæ*. Many varieties of the daffodil are in cultivation, differing chiefly in bulk and in the form of the flower, which is of a bright primrose-yellow color. There are other forms of the name in local or partial use. See NARCISSUS.

DAGHESTAN (däg-es-tän′), a province of Transcaucasia, Russia, stretching along the W. side of the Caspian Sea; area, 11,471 square miles. Its fertile and tolerably cultivated valleys produce good crops of grain, and also silk, cotton, flax, tobacco, etc. The inhabitants, almost all professed Mohammedans, consist chiefly of races of Tartar origin and of Circassians. Capital, Derbend. Pop. about 700,000.

DAGNAN-BOUVERET, PASCAL ADOLPHE JEAN, a French historical and portrait painter. Born in Paris in 1852 and, after years of study, won success with a picture entitled "The Consecrated Bread" (1886), now displayed in the Luxembourg. Other important paintings of his are "The Conscripts" (1891); "Spanish Dancer" (1909); and "Marguerite au Sabat" (1912). In 1885 he was made Chevalier of the Legion of Honor and in 1889 received the first medal of the Salon for his painting "Breton Women at the Pardon." Specimens of his work are in the New York Metropolitan Museum of Art and in many European galleries.

DAGO, an island formerly belonging to Russia, now part of the Republic of Esthonia, to the S. W. of the entrance of the Gulf of Finland, with productive fisheries. The inhabitants, almost all Swedes, are about 17,500. Area, 370 square miles.

DAGOBERT I. (dä-gō-bĕr′), (called the Great on account of his military successes), King of the Franks, in 628 succeeded his father Clothaire II. After a successful magnificent, but licentious reign, he died at Epinay in 638.

DAGON, a national god of the Philistines worshiped at Gaza (Judges xvi:21-30), Ashdod (I Sam. v: 5, 7, and I Chron. x: 10), and elsewhere.

DAGUERRE, LOUIS JACQUES MANDE (dä-gār′), a French inventor; born in Cormeilles, Seine-et-Oise, in 1789. He was a scene-painter at Paris, and as early as 1814 had his attention directed by Nicéphore Nièpce to the subject of photographic pictures on metal. In 1829 they made a formal agreement to work out the invention together, but it was not till after Nièpce's death, on July 5, 1833, that Daguerre succeeded in perfecting the process since called daguerreotype. The new process excited the greatest interest. Daguerre was made an officer of the Legion of Honor, and an annuity of 6,000 francs was settled on him. Daguerre died July 10, 1851.

DAGUERREOTYPE PROCESS, the original photographic process, consisting in sensitizing a silver plate with the vapor of iodine, and then placing it in a camera obscura previously focused, and afterward developing the picture by vapor of mercury. It is then fixed by immersion in hyposulphate of sodium. After thorough washing and drying the picture is covered with glass to prevent its being rubbed off. Daguerreotype has now been superseded by the collodion and other processes. See PHOTOGRAPHY.

DAGUPAN, a town on the Dagupan river, near the Gulf of Lingayen on the island of Luzon, in the Philippines, in the province of Pangasinán; on the railroad from Manila, and about 130 miles N. W. of that city. It is situated in a fertile region, producing chiefly corn, sugar, and tobacco. Pop. about 25,000.

DAHLAK, a group of three islands, with many smaller rocks, in the Red Sea, off the Bay of Massowah. They were famous in Roman times for their pearl-fisheries, but the beds have long since been exhausted and abandoned. The islands are a dependency of Italy. Area, about 420 square miles; pop. about 1,500.

DAHLGREN, JOHN ADOLPH, an American naval officer; born in Philadelphia, Pa., Nov. 13, 1809; entered the navy as a midshipman in 1826, and rose through the grades to the rank of rear-admiral. He rendered efficient service in suppressing blockade-running during the Civil War. He was an authority on ordnance and invented the famous Dahlgren gun. He died in Washington, D. C., July 12, 1870.

DAHLIA (so called after Andrew Dähl, a Swedish botanist and a pupil of Linnæus, by whom this beautiful garden plant was first brought into cultivation), a genus of composite plants, tribe *Asteroideæ*, sub-tribe *Ecliptex*. Two species are cultivated in gardens, *D. superflua*, which has the outer involucre reflexed, and *D. frustranea*, in which it is spreading. *D. variabilis* is a cross between the two. Both are from Mexico.

DAHOMEY (native name of the people, Dauma or Dahomé), a colony of French West Africa between Lagos (British) and Togoland and extending

northward to the French Military Territories. The long lagoon which, shut in from the ocean by a protecting bank of sand, affords an easy route along nearly the whole of this coast, extends in Dahomey, from its W. frontier almost to the Denham lagoon, in the E. About midway is the port of Whydah, whence a road extends inland to Abomey, a distance of 65 miles. Dense forests and dismal swamps cover nearly two-thirds of this distance, but from the Great Swamp of Agrimé vast undulating plains rise for many miles, in the direction of the Kong Mountains. The Avon and Denham lagoons receive the rivers of the country, none of which are very important. The soil is a rich, red-colored clay, and is extremely fertile. Groves of oil-palms encircle each town, and palm-oil is made in large quantities. Maize, beans, and peas, as well as cassava, yams, sweet potatoes, limes, oranges, pineapples, and other tropical fruits, grow in splendid luxuriance; cotton, sugar, and spices of all kinds are also grown, and sheep, goats, swine, and poultry are raised, though not in large numbers. Cotton cloth is made, and weapons and tools are forged from native iron. The imports in 1918 amounted to 12,819,239 francs and the exports to 13,690,478 francs.

The people are negroes, of the Ewe group, generally of small stature, but very robust and active. The Dahoman kingdom dates from the beginning of the 18th century, and reached its zenith under Gezo, who ruled from about 1818 to 1858. The Amazons (devoted to celibacy), who are distinguished for their bravery and ferocity, may perhaps be limited to 1,000. Fetich-worship prevails, taking the form of serpent-worship along the coast; a temple with over a hundred of these sacred snakes exists in Whydah. The king is the most absolute of despots. Wholesale murder is one of the chief features in religious and state ceremonies; but, according to Sir Richard Burton, who visited Dahomey in 1863, the number of the victims has been greatly exaggerated, and they are principally foreign captives. Still, as many as 500 human victims have been sacrificed at one of the grand "customs" which take place every October. The revenue formerly depended greatly upon the sale of slaves; but the vigilance of the cruisers employed to prevent the traffic has ruined the trade. Hence the monster slave-hunts which periodically took place are a thing of the past. In 1876 the coast of Dahomey was placed under a strict blockade by Great Britain, on account of an outrage on a British subject, for which the King of Dahomey refused satisfaction.

DAINGERFIELD, ELLIOTT, an American artist, born at Harper's Ferry, Va., in 1859. He was educated in the public schools and privately, studied art at the Art Students' League in New York, and first exhibited at the National Academy of Design in 1880. After spending several years in Europe in the study of art, he became a public lecturer on art subjects and head of the Permanent Art School at Blowing Rock, N. C. He received medals at several expositions and numerous prizes for excellence in painting, was a member of the National Academy and of the Fine Arts Federation, wrote monographs on George Inness and R. A. Blakelock, and was a frequent contributor on art topics to newspapers and magazines.

DAIREN, or **DALNY,** a port on the peninsula of Liao-tung, Manchuria, about 19 miles N. of Port Arthur. The large harbor is ice-free and affords anchorage for ocean-going vessels. Considerable trade passes through it between Russia, Japan, and China, and the trade continually increases. The Japanese occupied it in 1904 and it was included in the lease to Japan of the Liao-tung peninsula in 1904 (extended in 1915 to 99 years) becoming in 1906 a free port. The port serves as the eastern terminus to the Siberian Railway, and is connected by rail with Mukden, Harbin, and the East China railway system. Dalny is the customs port for all leased territory, and the seat of the Japanese governor-general and administration. Imports (1918), 83,521,131 haikwan taels (tael=about $1.00); exports, 91,301,399 yen. During 1920 it figured in the Japanese operations against Russia. Pop. about 55,000.

DAIRY, the department of a farm which is concerned with the production of milk and its manufacture into butter and cheese. As a rule, the soil and climate of a country, and the nearness of suitable markets, determine in a great measure the choice between tillage and dairy husbandry. For milk dairies cows that yield abundantly are selected, while for butter and cheese dairies the rich quality of the milk is the principal point. Regularity in feeding is very important, and the nature of the food given has a great effect on the quality of the milk. The younger the cow is the richer is her milk, and the second and third years, therefore, are generally the most profitable, both quantity and quality being taken into account. In general, after the seventh or eighth year it is not considered advisable to continue the cow longer in milk, as her milk is fast deteriorating and she consumes more food than a young one.

In the United States the cattle of Ayr-

shire and Jersey hold the first place for dairy purposes, the first on account of the large yield which they give on comparatively poor feeding, the second for the richness of their milk. In the management of a dairy cleanliness is of the utmost importance, as no substance more easily receives and retains the odors and taste of putrescent matter than milk. No food, either vegetable or animal, should be allowed to enter the milk-house. A good mode of purifying the atmosphere of a milk-house is to dip clothes in a solution of chloride of lime and then hang them up on cords stretching from one corner to the other. In a similar way, too, the temperature of the room may be kept low during hot weather. The milk-room, therefore, should be built in such a manner as to be most easily cleaned and kept clean. The floor should be of smooth flagstones carefully jointed and dressed. It should have a slight slope toward the wall, where a channel is formed to convey all water and spilled liquid to a drain.

All cornices and moldings, or any projections or cavities where dust or dirt can lodge, should be as far as possible avoided. The practice of making a larder of a portion of the milk-house, or of having a number of cheeses drying on the shelves, is much to be reprehended. Spilled milk should never be allowed to remain an instant longer than is necessary for its removal. The liberal use of water (cold in summer and warm in winter) is always to be commended; a little common washing-soda dissolved in the water will be found useful in destroying any taint of sourness the milk-dishes may have acquired. The best dishes for milk are made either of glass, tin, tinned-iron, or well-glazed earthenware. Wood is objectionable because it is difficult to keep the dishes clean, and lead and zinc are liable to corrosion or decomposition from the acid of the milk. See also BUTTER; CHEESE.

DAISY, the common name of the well-known plants and flowers of the genus *Bellis*, especially *B. perennis*. The French call the daisy "Marguerite," from the Greek word *margarita*=a pearl. Though daisies are very common in many parts of the world, they are not universally distributed; for instance, the traveler may wander over hundreds of miles in the Indian Empire without seing one solitary daisy.

DAKIN'S SOLUTION, a preparation of sodium hypochlorite, containing boric acid. It is prepared by treating a solution of chlorinated lime with sodium carbonate, permitting the precipitated calcium carbonate to settle, syphoning off the clear liquor and neutralizing with boric acid. The resulting liquid is used as an antiseptic and came into prominence during the World War, when it was employed in the French military hospitals for irrigating wounds. The preparation was discovered by Berthollet in 1788, but was not commonly used until it was reintroduced by Doctor D. H. Dakin of New York, while he was serving as bacteriologist in France. The antiseptic action of the solution is one of oxidation, brought about either by the decomposition of the hypochlorite with formation of oxygen, or indirectly through the formation of chloroamide groups.

DAKOTA. See NORTH DAKOTA; SOUTH DAKOTA.

DAKOTA, or DAKOTAH. See SIOUX.

DAKOTA WESLEYAN UNIVERSITY, an institution for higher education, founded at Mitchell, S. D., under the auspices of the Methodist Episcopal Church. It includes a College of Liberal Arts, and schools of commerce, education, elocution, and art. In 1919 there were 32 instructors and 538 students. President, W. D. Schermerhorn, S. T. B.

D'ALBERT, EUGEN, an Anglo-German pianist and composer; born in Glasgow, Scotland, April 10, 1864. He studied at Weimar under Liszt and became famous as a performer when only 18 years of age. He made numerous successful concert tours in the United States and throughout Europe, and was especially famous for his interpretations of Bach and Beethoven. He was considered one of the finest technicians and his intellectuality and fire placed him in the foremost rank of pianists. His compositions included many pieces for the piano, numerous songs, and several operas, of which latter "Im Tiefland" was performed in New York in 1908.

DALECARLIA, or DALARNE, a tract in Sweden. The name, meaning "valley-land," is kept alive in the minds of the inhabitants by the noble struggles which the Dalecarlians, its inhabitants, made to establish and maintain the independence of the country.

D'ALEMBERT, JEAN LE ROND (dä-lon-bär'), a French mathematician and encyclopædist; born in Paris, Nov. 16, 1717; was the natural son of Madame de Tencin and the Chevalier Destouches; and was brought up by the wife of a poor glazier; but his father, without publicly acknowledging the paternity, secured to him an allowance of 1,200 francs a year. At 12 the boy entered the College Ma-

zarin, where he soon showed his lifelong passion for mathematical studies. His first distinction was admission at 23 to the Academy of Sciences. Two years later appeared his "Treatise on Dynamics," which reduces all the laws of motion to the consideration of equilibrium, thereby marking an epoch in mechanical philosophy. Later works were: "General Cause of Winds," which gained the prize of the Academy of Berlin, 1746, and which contains the first conception and use of the Calculus of Partial Differences; "Equilibrium and Movement of Fluids" (1744); "Precession of the Equinoxes and Change of the Axis of the Earth" (1749); and "The Several Important Points in the System of the World" (1754). His "Mathematical Works" (8 vols. 1761-1780) contain an immense number of memoirs, some on new subjects, some containing developments of his previous works.

D'Alembert did not confine himself to physical science. For the great "Encyclopédia" planned by Diderot he wrote the famous "Preliminary Discourse," a noble tribute to literature and philosophy. Besides numerous articles in the "Encyclopédia" (the mathematical portion of which he edited), he published books on philosophy, literary criticism, the theory of music, and a treatise "On the Destruction of the Jesuits" (1765), which involved him in controversy. He became secretary to the Academy in 1772, and thereafter he wrote the lives of all the members deceased between 1700 and that year—one of the most pleasing of his works. His literary works have been published by Bossange (5 vols., 1821). He died Oct. 29, 1783.

DALHOUSIE, JAMES ANDREW BROWN RAMSAY, 10th **EARL** and 1st **MARQUIS OF,** a British statesman; born in 1812; was educated at Harrow and at Christchurch, Oxford. After filling the offices of vice-president (1843) and president of the board of trade (1844), he was appointed governor-general of India (1847). In this post he showed high administrative talent, establishing railway lines, telegraphs, irrigation works, etc., on a vast scale. He greatly extended the British empire in India, annexing the Punjab, Oude, Berar, and other native states, as well as Pegu in Burma. In 1849 he was made a marquis, and obtained the thanks of both Houses of Parliament. He outstayed his term of office to give the government the aid of his experience in the annexation of Oude; and when he returned to Europe in 1856 it was with a constitution so completely shattered that he was never able to appear again in public life, and died Dec. 19, 1860.

DALLAS, a city and county-seat of Dallas co., Tex.; on the Trinity River, and the Gulf, Colorado and Santa Fé, the Houston and Texas Central, the Missouri, Kansas and Texas, the Texas and Pacific, Chicago, Rock Island and Gulf, the St. Louis Southwestern, the St. Louis and San Francisco, and other railroads; 32 miles E. of Fort Worth. It is the metropolis of N. Texas, and although comparatively a young city, is well laid out and substantially built. Area, 19 square miles.

Business Interests.—Dallas is in the great grain belt of the State, and has large cotton, mining, manufacturing, and commerical interests. It is the leading manufacturing city of the State, and it is also the largest inland cotton market in the United States, handling over 1,500 bales of spot cotton yearly. The principal articles were cotton machinery, leather goods, shoes, dressed meat, cotton goods, foundry and machine-shop products, cement and clothing. There were in 1920 5 National banks, and several private banking houses. The assessed real and personal property valuation in 1919 was $103,587,650.

Public Interests.—In 1919 the city had 342 miles of streets, of which 152 miles were paved; 218 miles of water mains; and electric light and water plants, the latter owned by the city. Among the prominent buildings are the Catholic and Episcopal churches, the United States Court-house, the Texas State Fair and Dallas Exposition buildings, Cathedral of the Sacred Heart (R. C.), Cathedral of St. Matthew (P. E.), Ursuline Convent, St. Mary's Orphanage, St. Paul's Sanitarium (all R. C.), and St. Mary's College (P. E.). Dallas is the seat of the Southern Methodist University, and has hospitals, and a park system of nearly 800 acres. There is a boulevard system of over 60 miles. There are over 25,000 pupils in the public schools, and the annual cost of maintaining the school system is about $850,000. Pop. (1910) 92,104; (1920) 158,976.

DALLAS, GEORGE MIFFLIN, an American diplomatist; born in Philadelphia, Pa., July 10, 1792. He was graduated at Princeton College in 1810. In 1813 he was admitted to the bar, and soon after entered the diplomatic service. In 1831 he was elected a United States Senator from Pennsylvania. He was United States minister to Russia from 1837 to 1839, and in 1844 was elected Vice-President of the United States. In 1846 his casting-vote as President of the Senate repealed the protective tariff of

1842, though he had previously been considered a Protectionist. His course on this question aroused much indignation in Pennsylvania. He was United States minister to Great Britain from 1856 to 1861. He died in Philadelphia, Dec. 31, 1864.

DALLES (dalz), the name given to various rapids and cataracts in North America. The Great Dalles of the Columbia are about 200 miles from the mouth of that river, where it is compressed by lofty basaltic rocks into a roaring torrent about 58 yards in width; the Dalles of the St. Louis are a series of cataracts near Duluth, Minn.

DALLES, THE, a city and the county-seat of Wasco co., Ore.; on the Columbia river, and on the Great Southern railroad, and on the line of the Oregon-Washington Railroad and Navigation Company; 85 miles E. of Portland. It is named after the rapids of the Columbia river near here; is a shipping point for grain, stock, and wool; and has tanneries, foundries, flour mills, canning factories, etc. There is a Catholic seminary for girls, an academy, a Carnegie library, a hospital, and public schools. Pop. (1910) 4,880; (1920) 5,807.

DALLIN, CYRUS EDWIN, an American sculptor, born in Springville, Utah, in 1861. He was educated in the public schools and studied art in Paris. In 1888 he received the gold medal of the American Art Association in New York. This was followed by many medals and prizes at exhibitions. He was instructor in sculpture at the Massachusetts State Normal Art School in Boston. His works are found in nearly every important art collection in the United States. He was an associate of the National Academy and a member of many societies of artists and sculptors.

DALMATIA (dal-māsh'ya), a former province of Austria, with the title of kingdom, the most S. portion of the former Austrian dominions. It consists of a long narrow triangular tract of mountainous country and a number of large islands along the N. E. coast of the Adriatic Sea, and bounded N. by Croatia, and N. E. by Bosnia and Herzegovina. In breadth it is very limited, not exceeding 40 miles in any part; its whole area is 4,940 English square miles. The inland parts of Dalmatia are diversified by undulatory ground, hills, and high mountains; but though there are some rich and beautiful valleys, the country on the whole must be considered poor and unproductive. The Narenta, the Zermagna, the Kerka, and the Cettina are the principal rivers, all with short courses. On some of these the scenery is singularly wild and picturesque. The interior is occupied by a much-neglected population, and agriculture is in a very backward state.

Timber is scarce, and the country does not produce sufficient grain for its own wants. Apples, pears, peaches, apricots, oranges, pomegranates, etc., are among the fruits; the wines are strong, sweet, and full-bodied. On the coast fish, especially the tunny and the sardine, abound. The trade of the country is mostly confined to the coast towns, where the population is mainly of Italian extraction. Chief of these are Zara (the capital), Sebenico, Cattaro, Spalato, and Ragusa. Among the numerous islands sprinkled along the coast many are valuable for their productions, such as timber, wine, oil, cheese, honey, salt, and asphalt. The population is divided between the Italians of the coast towns and the peasants of the interior, Slovenian Slavs speaking a dialect of the Slavonic. The majority are Roman Catholics. After passing successively through the hands of Hungarian and Venetian rulers, and of the first Napoleon, Dalmatia finally, in 1814, fell under Austrian rule.

Following the revolution in Austria-Hungary in 1918, Dalmatia declared itself independent, and afterward joined the movement which resulted in the formation of Jugoslavia. Italy, at the Peace Conference, put forth claims for Dalmatia, and its final disposition was not decided until 1920, when, as a result of negotiations in relation to Fiume, Dalmatia was awarded to Jugoslavia. Pop. about 650,000. See FIUME, JUGOSLAVIA.

DALMORES, CHARLES, a French tenor; born at Nancy in 1871, he early began receiving instruction on the violin and entered the conservatory at Nancy with a view of becoming a violinist. This course he abandoned after he had broken his arm; he next took up the horn. He began his career in the Colonne orchestra, and from 1888 to 1894 was a member of the Lamoureux orchestra. In the latter year he became a teacher of the horn at Lyons, and there one of the masters began training his voice. In 1899 he made his début at Rouen as a tenor, and in 1906 Oscar Hammerstein engaged him as one of the leading tenors for the Manhattan Opera House Company of New York. In 1914 he became leading tenor of the Chicago Opera Company.

DALMY. See DAIREN.

DALTON, a city in and the county-seat of Whitfield co., Ga.; on the Southern and the Western and Atlantic railroads; 100 miles N. W. of Atlanta. It

is a winter and summer health resort, and has canning factories, cotton compresses, flour mills, foundries and machine shops, public schools, weekly newspapers, a National bank, etc. It was a place of strategic importance and was nearly destroyed during the Civil War. Pop. (1910) 5,324; (1920) 5,222.

DALTON, JOHN, an English chemist; born in Eaglesfield, Sept. 6, 1766. After teaching for 12 years at Kendal, in 1793 his reputation as a mathematician won for him the chair of mathematics at the New College, Manchester. Here he continued to reside (though the college was removed in 1799), publishing from year to year valuable essays and papers on scientific subjects, while he also lectured in London, and visited Paris. In 1808 he announced ("New System of Chemical Philosophy") his atomic theory of chemical action, the discovery of which spread his fame over Europe. Various academic and other honors were bestowed upon him, and in 1833 he received a pension. He died July 27, 1844.

DALY, ARNOLD, an American actor, born in Brooklyn, N. Y., in 1875. He attained considerable prominence by his productions and interpretations of George Bernard Shaw's plays, appearing in 1903 in "Candida," in 1904 in "Mrs. Warren's Profession," and "You Never Can Tell," in 1906 in "Arms and the Man" and the "Man of Destiny." In the season of 1911 he played at the Criterion Theatre, London, and in 1913-1914 played in "General John Regan" in New York.

DALY, (JOHN) AUGUSTIN, an American dramatist and theatrical manager; born in Plymouth, N. C., July 20, 1838. Included in his original plays are: "Divorce," "Pique," "Horizon," "Under the Gaslight," and a story called "Peg Woffington, a Tribute to the Actress and the Woman." At various times during his career he managed some of the most popular and successful actors and actresses in the United States, including Fanny Davenport, Clara Morris, Ada Rehan, etc. He died in Paris, June 7, 1899.

DAM, a barrier built across a stream, valley, or other depression, for the purpose of impounding or regulating the flow of water behind it. Dams are constructed to supply water and water power to communities, for irrigation projects, for hydroelectric development, to make streams navigable, and for similar purposes. Dams may be constructed of earth, timber and loose stone, stone masonry, steel, or, as has been the most general practice of recent years, re-enforced concrete. A dam must be designed to prevent failure by overturning, by sliding at the base or at horizontal joint, by crushing (in the case of masonry dams), by fracture caused by tension, and by erosion. The head or height of the water behind the dam determines the pressure that the dam has to withstand, not the volume of water behind it. Every well-designed dam has ample provision for the easy passage of flood waters, because force exerted by an extremely large volume of water passing over the crest of the dam would possibly cause its failure. To guard against this possibility flood gates, spillways, or tunnels are used.

Earth dams are made by packing successive layers of earth. The earth may be drawn in carts or buckets, and packed by rolling, or by water, or the earth may be both transported and packed by hydraulic means. Usually, in an earth dam, the upstream face of the dam is paved with some material more resistant to seepage than earth, or the dam is provided with a waterproof lining or corewall. Earth dams vary in height from a few feet to over 100 ft., and in length from a few feet to miles.

Masonry dams are constructed either of stone set with cement mortar, or of re-enforced concrete. The cross section of a modern masonry dam of the gravity type resembles in general a right-angle triangle, except that the sides are somewhat curved. The approximately vertical side is placed upstream, the base is liable to be rather broad, and the top rounded. Some engineers favor the use of the arch principle, either single or multiple, to resist the force of the water, and it is said that a considerable saving of material may be gained with no loss of strength. Another recent development in dam design is the hollow re-enforced concrete dam, which consists essentially of water-tight concrete slabs supported on piers.

Rock-fill dams are constructed by piling large stones together, and facing the upstream side with planks, concrete, or other waterproof material.

Steel dams never had a great vogue, and timber dams are seldom constructed by modern engineers, except as temporary structures.

Dams which are built to aid navigation, are usually so constructed that they may be raised or lowered.

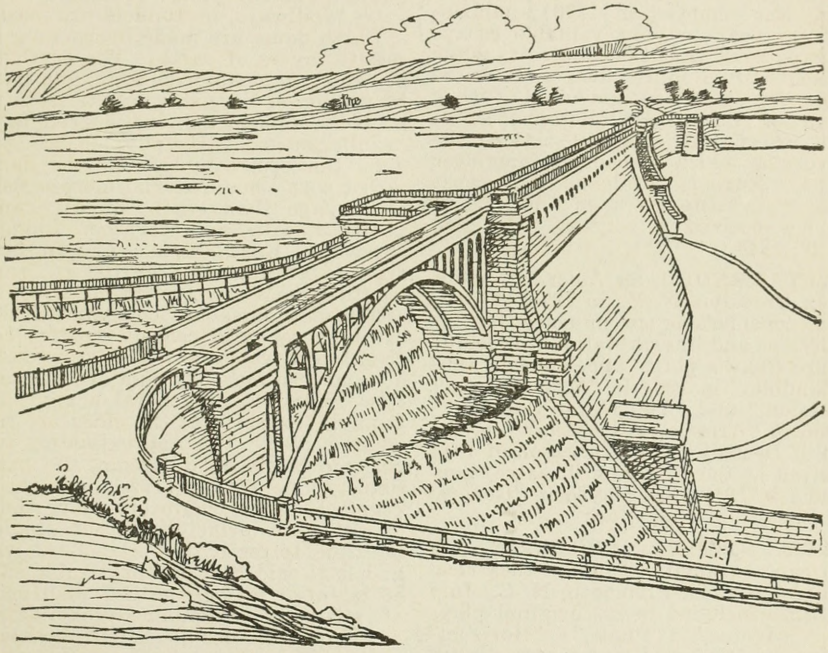
The Gatun Dam across the Chagres river, Panama canal, is an earth dam. It was partly constructed by the hydraulic method. It is about 115 feet high and over 1½ miles long. The base of the dam, which is about sea-level, is 2,020 feet wide. At the water line,

which is located 85 feet above the base, the dam is 390 feet thick, and it is 100 feet thick at its top. The dam is built with very flat slopes to provide unusual stability. The dam has a spillway channel 819 feet wide. Over 20,000,000 cubic yards of material were used in its construction.

The San Leandro Dam of the San Francisco waterworks is an earth dam with no core-wall, and is 158 feet high.

The Goose Creek Dam of the Oakley Irrigation project is an earth dam built in layers, and completed in 1913. It is 145 feet high, 1,025 feet long and 750 feet wide at the base.

The Shoshone Dam is a masonry dam built by the United States Reclamation Service in Wyoming near Cody. It is 324 feet high, curved upstream, 10 feet thick at the crest, and 108 feet thick at its base, which thickness is continued up to the level of the river bed. The Roosevelt Dam was also constructed by the United States Reclamation Service. It is located in Arizona, has a maximum height of 284 feet, a storage capacity of 420,000,000,000, and was completed in 1911. The Arrowrock, near Boise, Idaho, construction of which was started in 1914 by the same Government agency, is 354 feet high, and 1,060 feet long. It



NEW CROTON DAM, NEW YORK

The highest earth dam ever attempted is the Calaveras Dam of the Spring Valley Water Company of San Francisco. This dam is 240 feet high, the crest length is 1,300 feet, the base is 1,300 feet wide, the upstream slope is 3 to 1, and the down stream slope is 2½ to 1. It is a hydraulic fill dam.

The new Croton Dam of the New York City Water Supply System was completed in 1907, and provides a storage capacity of 32,000,000,000 gallons of water. It is a masonry dam with a crest length of 2,168 feet, and a height of almost 300 feet. There is a roadway on the top of the dam. The spillway is 1,000 feet long, and varies in width from 50 to 125 feet.

is curved upstream, with a gravity section, and is built of concrete.

The Keokuk Dam, which crosses the Mississippi river at Keokuk, Ia., is a long, low concrete dam. Besides the spillway section, 4,278 feet long, there is an abutment 290 feet long, a combination, another 1,700 feet long, in the form of a power house, and a lock section of about 600 feet.

The Elephant Butte Dam, located near Engle, N. M., was dedicated on Oct. 19, 1916. It is a Reclamation Service dam of rubble concrete, with a gravity section. It is 1,200 feet long and 304.5 feet high from base to top.

The hydro-electric development dam of the Yadkin river, N. C., contains a dam

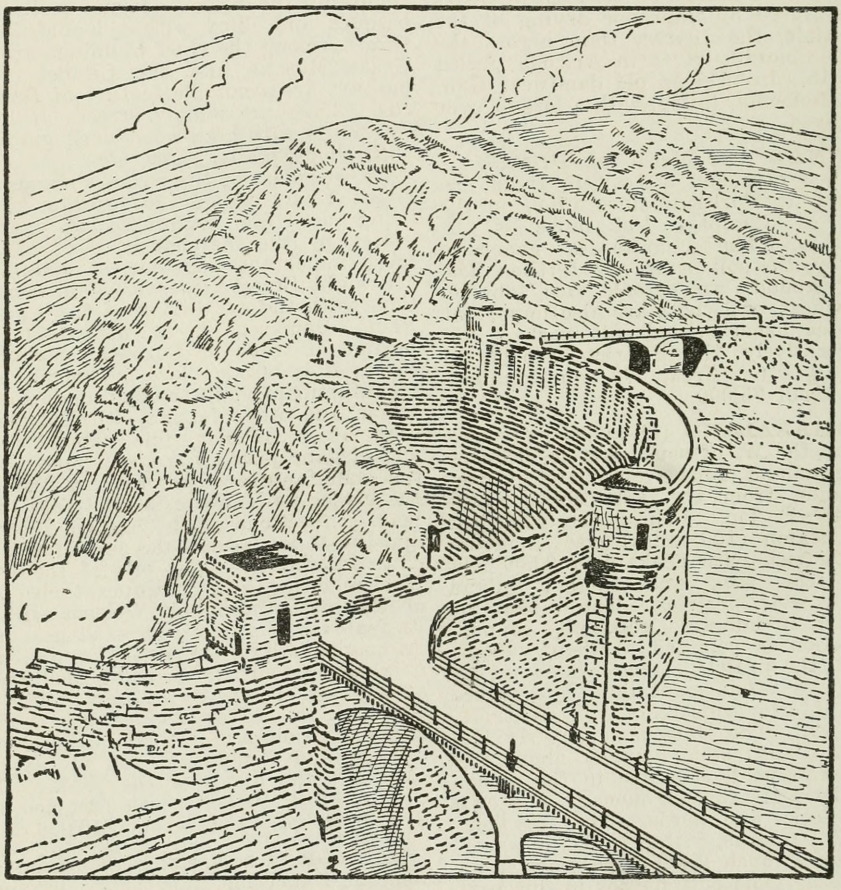
built of concrete, 1,400 feet long, and 217 feet in height.

The Noguera Pallaresa River Dam in Spain was built and designed by American engineers. It is 330 feet high, 700 feet long, has a base width of 230 feet, and is built of concrete.

The deep water plans for the Mississippi river include the construction of numerous dams, and in 1917 Dam No. 1, located near St. Paul, was placed in operation. It made the river available for navigation for 13 miles.

In New South Wales the Murray River Dam has been planned as part of an irrigation project. It will be 3,600 feet long, and have both earth and concrete sections.

In 1864 a poorly constructed earth dam at Sheffield, England, went out the first time it was put to use, and caused a flood which cost 238 lives. No engineer was employed to design the Mill River Dam at Williamsburg, Mass., which went out in 1874, with a loss of 143 lives, and $1,000,000 in property. The



ROOSEVELT DAM, ARIZONA

The Hetch Hetchy Dam of the San Francisco water system will be one of the largest masonry dams in the world. The height from foundation base to crest will be 311 feet. It will be a masonry dam with a straight gravity section of 600 feet, and will have a siphon spillway. It will be located in the Tuolumne river 150 miles E. of San Francisco.

South Fork Dam, owned by the South Fork Hunting and Fishing Club of Pittsburgh, Pa., was an earth dam of 70 feet height. It was designed to have a spillway of 150 feet, but this was not carried out, and the existing spillway was partially blocked with screens, bridge supports, etc., when in May, 1889, excessive rains caused the water to go over the entire length of the dam. The

dam itself was carried away, and flooded the town of Johnstown, Pa., with a loss of over 2,000 lives and about $4,000,000 in property. The Walnut Grove Dam in Arizona failed on Feb. 22, 1890. This dam was a rock-fill structure, and the failure was caused by inadequate spillway. The Colorado River Dam at Austin, Tex., failed in 1900 because of poor foundations; and because of faulty construction, the concrete dam at Austin, Pa., failed on Sept. 30, 1911, and cost 35 lives. Because of structural weakness caused by improper drying of the materials, the Lyman Dam across the Little Colorado river in Arizona, failed in 1915. In 1916 an old dam near Gablonz, Bohemia, failed, with a loss of over 300 lives.

DAMAN (dä-män'), or **DAMÃO**, a fortified post and district in India, belonging to Portugal since 1558, on the Gulf of Cambay, 100 miles N. of Bombay. The climate is generally healthy, the soil moist and fertile. The chief products are cereals, rice, tobacco, and wheat, and there are also important deep-sea fisheries and salt works. Administratively the district belongs to GOA (*q. v.*). Area, 170 square miles; Pop. about 75,000.

DAMARALAND (dä-mä'rä-), a territory in the W. of south Africa, between Namaqualand and Ovampoland proper, extending from the Atlantic to about 19° 45' E. lon. Behind the waterless coast region (100 miles) rises a mountain district, with peaks over 8,500 feet above the sea; and farther inland stretch wide prairies. The mountains are rich in minerals, especially copper; vegetation is confined to their valleys, and to the prairie region, which in the N. enjoys a fine rainfall. The produce of the interior consists of ivory, feathers, skins, etc. The Damaras, properly Herero, a Bantu stem, number about 80,000, of whom 50,000 live in the mountain district; they are nomads, and own large flocks and herds. The Hawkoin, or Hill Damaras, in the N. E., however, who are a much lower type, now speak Hottentot. The only harbor in this part of the coast is Walfish Bay, which belongs to Great Britain. The rest of Damaraland forms part of the former German colony, GERMAN SOUTHWEST AFRICA (*q. v.*). In 1884 the desert region along the coast was made a German protectorate.

DAMASCUS, a celebrated city, formerly capital of the Turkish vilayet of Syria, now capital of the independent state of SYRIA (*q. v.*). It is beautifully situated on a plain which is covered with gardens and orchards and watered by the Barrada. The appearance of the city, as it first opens on the view, has been rapturously spoken of by all travelers; but the streets are narrow, crooked, and in parts dilapidated, and, except in the wealthy Moslem quarter, the houses are low, with flat-arched doors and accumulations of filth before the entrance. Within, however, there is often a singular contrast, in courts paved with marble and ornamented with trees and spouting fountains the rooms adorned with arabesques and filled with splendid furniture. Among the chief buildings are the Great Mosque and the Citadel. The bazaars are a notable feature of Damascus. They are simply streets or lanes covered in with high wood-work and lined with shops, stalls, cafés, etc.

In the midst of the bazaars stands the Great Khan, it and 30 inferior khans being used as exchanges or market places by the merchants. One of the most important and busiest streets is "Straight Street," mentioned in connection with the conversion of the Apostle Paul. Damascus is an important emporium of trade in European manufactures; it is also a place of considerable manufacturing industry in silk, damasks, cotton and other fabrics, tobacco, glass, soap, etc. Saddles, fine cabinet-work, and elegant jewelry are well made; but the manufacture of the famous Damascus blades no longer exists. It has railway connections with Aleppo, Beirut, and the Hejas, and is the seat of a Melchite Patriarch. It is one of the holy Moslem cities, and continues to be one of the most thoroughly Oriental in all its features of any city in existence. Of its origin nothing certain is known; but it is of great antiquity, being mentioned as a place apparently of importance in Gen. xiv: 15. After passing successively under the power of Israelites, Persians, Greeks, and Romans, it fell at last in 1516 into the hands of the Turks. On Oct. 1, 1918, the city was occupied by British troops. Pop. about 250,000.

DAMASK, a rich silk stuff originally made at Damascus, and thence deriving its name. It had raised figures in various patterns, and flowers in their natural colors embossed upon a white or colored ground. The work was probably of the nature of embroidery in the first place, but the figures were afterward exhibited on the surface by a peculiar arrangement of the loom, which brought up certain of the colors and depressed others, according to the requirements of the pattern.

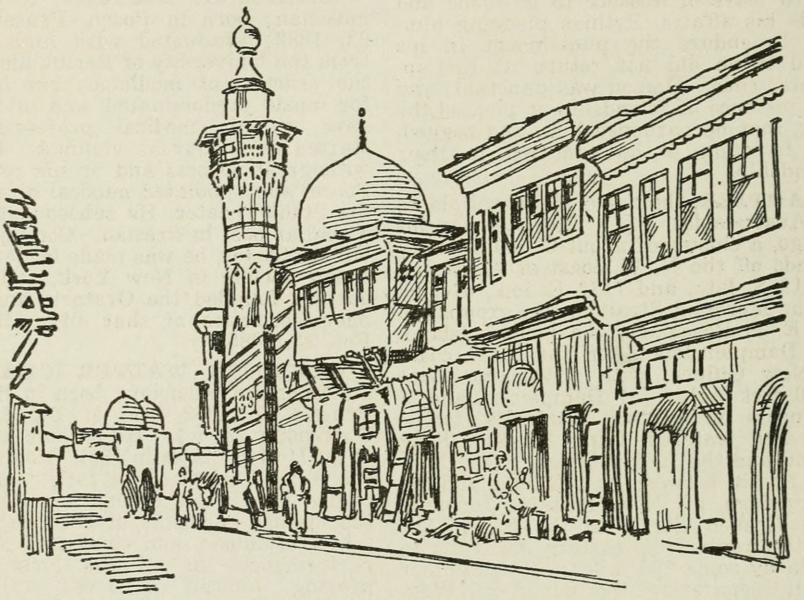
Also a woven fabric of linen, extensively used for table-cloths, fine toweling,

napkins, etc. By a particular management of the warp-threads in the loom, figures, fruits, and flowers are exhibited on the surface, as in the ancient damask.

DAMIEN, FATHER (dä-myan'), (JOSEPH DAMIEN DE VEUSTER), a Belgian priest; born in Louvain, Jan. 3, 1841; in 1873 devoted himself to the duties of spiritual guide to the lepers confined to the Hawaiian island of Molokai. Sent on a mission to Honolulu, where he heard from the bishop the neglected state of the lepers, some 700 or 800 in number, who lived on that small island, he volunteered to establish himself among them; and from 1877 onward became physician of their souls and bodies, their magistrate, teacher, carpenter, gardener, cook, and even gravedigger at need. For long he worked on single-handed at his noble labors, but was ultimately joined by another priest. For 12 years he escaped all contagion of the fatal disease, though in constant contact with the sick and dying; but in 1885 the malady appeared in him; yet he continued unabated his heroic labors till near his death, April 10, 1889.

DAMIETTA (dam-i-et'tä), a town of Lower Egypt, on the right bank of the chief E. mouth of the Nile, about 8 miles from its mouth. It is irregularly but well built, and has some handsome mosques and marble baths, and several bazaars. Its commerce has been much injured by the prosperity of Alexandria, but it still carries on a considerable trade in exporting rice, fish (from Lake Menzala), coffee, and dates. The existing town was erected after 1251, but, prior to that, a city of the same name (more anciently Tamiáthis) stood more to the S. It was strongly fortified by the Saracens, and formed on that side the bulwark of Egypt against the early crusaders, who, however, succeeded in capturing it more than once. It was razed, and rebuilt farther inland on the site it now occupies, by the Mameluke Sultan Beybars. Pop. about 30,000.

DAMMARIN, a resin found in various species of dammar. *D. orientalis* furnishes one kind, which, mixed with chalk and pulverized bamboo-bark, is used for caulking ships. Another kind, obtained from the *D. australis*, or cowrie pine of New Zealand, is dissolved in turpentine and used as a colorless varnish. It is also used for mounting purposes instead of Canada balsam. The best form of varnish is to dissolve one ounce of dammar gum in a fluid ounce of turpentine; to dissolve one ounce of mastic in two fluid ounces of chloroform, and mix.



DAMASCUS

DAMOCLES (dam'ō-klēz), a sycophant at the court of Dionysius of Syracuse in the 4th century B. C. When he was one day extolling the happy condition of princes, the tyrant invited him to a sumptuous entertainment, but caused a naked sword to be suspended over his head by a single hair; a sufficiently sig-

nificant symbol of the fear in which tyrants may live.

DÁMODAR, a river of Bengal, which after a S. E. course, falls into the Hugli, just above the James and Mary Sands. A little below the mouth of its chief tributary, the Barákhar, which it receives from the N., the Dámodar becomes navigable. The valleys of these two streams contain the coal-fields which produce about four-fifths of the whole amount of coal mined in British India. Length about 350 miles.

DAMON, a Pythagorean philosopher, memorable for his friendship with Pythias, or Phintias. Dionysius of Syracuse having condemned Damon to death, he obtained leave of absence to go home and settle his affairs, Pythias pledging himself to endure the punishment in his stead if he did not return at the appointed time. Damon was punctual; and this instance of friendship so pleased the king, that he pardoned him, and begged, but in vain, to be admitted to their friendship.

DAMPIER, the name of several places in Australasia: (1) Dampier Archipelago, a cluster of about 20 small rocky islands off the N. W. coast of Australia, in 21° S. lat.., and 117° E. lon., divided by the Mermaid Strait in two groups; in the E. is Rosemary, the largest island. (2) Dampier Island, off the N. E. coast of New Guinea, with a volcano about 5,250 feet high. (3) Dampier's Land, a peninsula of Western Australia, fertile and well watered, lying between King Sound and the Indian Ocean. (4) Dampier Strait, between New Guinea and the archipelago of New Britain, forming, with Goshen Strait to the S. E., the shortest route from eastern Australia to China by some 300 miles. (5) Dampier Strait, separating the island of Waygiou from the N. W. extremity of New Guinea, the safest and easiest passage between the Indian and Pacific Oceans.

DAMPIER, WILLIAM (dam'pēr), an English navigator; born in East Coker, Somersetshire, in 1652; became a mariner at an early age. During many years of active service in privateers and trading-vessels, he several times visited the South seas; and the results of his observations were given to the public in a work entitled "A Voyage Round the World," which for accuracy and interest, as well as for professional knowledge, possesses considerable merit. He died about 1715.

DAMROSCH, FRANK HEINO (däm'-rosh), an American musician; born in Breslau, Germany, June 22, 1859. He was trained by his father, LEOPOLD (*q. v.*), and in 1882 became conductor of the Denver Chorus Club and supervisor of music in the public schools of that city. He was chorus master at the Metropolitan Opera House, New York, from 1885 to 1891, and in 1892 organized the People's Singing Class. From 1897 to 1905 he was director of music in the public schools of New York City. In 1893 he established the Musical Art Society and in 1898 the Symphony Concerts for Young People. Beginning with 1886, he was director of various choral and orchestral societies in Newark, N. J., Philadelphia, and New York. In 1905 he organized the Institute of Musical Art, New York.

DAMROSCH, LEOPOLD, a German musician; born in Posen, Prussia, Oct. 22, 1832; graduated with high honors from the University of Berlin, and began the practice of medicine; but his love for music predominated, and in 1864 he gave up his medical profession and started on a tour as violinist. He met with great success and on his return to Posen was appointed musical director at the Stadt-Theater. He subsequently held a similar post in Breslau. Coming to the United States, he was made leader of the Arion Society in New York, and subsequently founded the Oratorio and Symphony societies of that city. He died Feb. 15, 1885.

DAMROSCH, WALTER JOHANNES, an American musician; born in Breslau, Prussia, in 1862; son of DR. LEOPOLD DAMROSCH (*q. v.*). He became a citizen of the United States in 1871. He inherited the musical talent of his father, and succeeded him in his enterprises. He was the special exponent of the Wagnerian school of music, and conducted operatic performances in all the large cities, proving himself a most acceptable leader. He also composed an opera founded on Hawthorne's tale of "The Scarlet Letter," besides other excellent music. He married in 1890 Margaret, daughter of James G. Blaine. In 1903 he reorganized as a permanent orchestra the New York Symphony Orchestra to the leadership of which he devoted himself exclusively since then and which he put in the forefront of symphony orchestras. The entire orchestra made a highly successful tour of France and England in 1920. During the World War he reformed the military bands of the A. E. F. and founded a school for bandmasters at General Headquarters, Chaumont, France.

DAMSON, a variety of the common plum (*Prunus domestica*). The fruit is rather small and oval, and its numerous sub-varieties are of different colors:

black, bluish, dark purple, yellow, etc. The damson (corruption of Damascene), as its name imports, is from Damascus.

DAN, one of the sons of Jacob by his concubine Bilhah. At the time of the exodus the Danites numbered 62,700 adult males, being then the second tribe in point of numbers. Samson was a member of this tribe.

DANA, CHARLES ANDERSON, an American journalist; born in Hinsdale, N. H., Aug. 8, 1819. He entered Harvard in 1839, but did not graduate. In 1842 he was a member of the Brook Farm Community, in Roxbury, Mass., remaining there only two years. From 1844 to 1847 he edited "The Harbinger," his associates being George Ripley, Parke Goodwin, and John S. Dwight. In 1847 he became managing editor of the New York "Tribune," with which he remained until 1861. In 1855, in connection with George Ripley, he projected and edited Appleton's "American Encyclopædia" in 16 volumes, which was completed in 1863, and revised in 1873-1877. He also edited a number of other works. From 1862 to 1865 he was in the service of the United States Government, during the last two years as Assistant Secretary of War under President Lincoln. About the beginning of 1866 he became editor of the Chicago "Republican," a daily paper. In 1868 he purchased an interest in the New York "Sun," also a daily, of which he was editor and chief proprietor until his death, Oct. 17, 1897. He was a man of forcible character and impressed his personality upon his paper.

DANA, JAMES DWIGHT, an American scientist; born in Utica, N. Y., Feb. 12, 1813. His researches into geology made him famous, and his professorship at Yale proved epoch-making in the history of that seat of learning. He published: "System of Mineralogy"; "Manual of Mineralogy"; "Text-Book of Geology"; "Corals and Coral Islands"; "The Geological Story Briefly Told"; etc. He died in New Haven, April 14, 1895.

DANA, JOHN COTTON, an American librarian and author. He was born in Woodstock, Vt., in 1856, was educated at Dartmouth College, and was admitted to the New York Bar in 1883. He did not practice law, but after some years of land-surveying in Colorado he finally became librarian at Denver in 1889. He then made library organization his study and greatly improved the efficiency of the city libraries in Springfield, Mass., and Newark, N. J. He was president of the American Library Association in 1896 and his works on library subjects include: "A Library Primer"; "Notes on Book-Binding for Libraries"; and several chapters in "Modern American Library Economy." He was also co-editor of: "Literature of Libraries in the Seventeenth and Eighteenth Centuries" (6 vols.); "Horace, the Roman Poet, Presented to Modern Readers"; "Copa: the Hostess of the Inn."

DANA, RICHARD HENRY, the Elder, an American poet and essayist; born in Cambridge, Mass., Nov. 15, 1787. His lectures on Shakespeare's characters, delivered in the principal cities of the Atlantic coast (1839-1840), awakened a deep public interest. His principal poems are: "The Change of Home" (1824); "The Dying Raven" (1825); "The Buccaneers" (1827). To a periodical publication "The Idle Man" (N. Y., 1821-1822), of which he was editor, he contributed critical papers and several short stories; among them "Paul Fenton" and "Edward and Mary." He died Feb. 2, 1879.

DANA, RICHARD HENRY, JR., an American lawyer and author; born in Cambridge, Mass., Aug. 1, 1815. He was perhaps best known as a writer through his book "Two Years Before the Mast," in which he described his voyage to California. He contributed to various papers and magazines and wrote some other books. He studied law under Judge Story and Professor Greenleaf, and was admitted to the bar in 1840. He died in Rome, Italy, Jan. 6, 1882.

DANAKIL (dä-nä-kēl'), (singular Dankali), the Arabic and now general name for the numerous nomad and fisher tribes inhabiting the coast of N. E. Africa, from Massowah S. to Tajurrah Bay, and from there S. W. to Shoa. They belong to the Ethiopic Hamites, and are well built and slender, with features indicating an intermixture of Arab blood. In a country of waterless plains, they are generally nomads, living partly by caravan traffic and the slave-trade, but mostly on the milk of their flocks.

DANBURY, a city and one of the county-seats of Fairfield co., Conn.; on the New York, New Haven and Hartford railroad; 62 miles N. E. of New York. It is the greatest hat-making city in the United States. It has also extensive manufactures of iron, brass, and silver-plated ware, bicycles, paper, foundry and machine shop products, etc. There are a court house, public library, State normal school, high school, public parks, electric street railways and lights, Soldiers' Monument, 2 National banks, daily and weekly newspapers, etc. A temporary settlement was made here in 1684, a meeting-house was erected in 1696, and for many years the place was known by

the Indian name of Paliquioque. In 1776 the place was made a depository for army stores, and when General Tryon, the British governor of New York, was informed of the fact he headed a force of over 2,000 men, landed at Norwalk, marched immediately upon Danbury, and set fire to the town and stores. Pop. (1910) 20,234; (1920) 18,943.

DANBY, FRANK (MRS. JULIA FRANKAU), a British authoress; born in 1864, she was educated largely by the daughter of Karl Marx, and in 1883 was married to Arthur Frankau. Most of her writings are novels, although she has contributed not a little to the "Saturday Review." Among her works are: "The Heart of a Child" (1908); "Sebastian" (1909); "The Story of Emma" (1910); "Joseph in Jeopardy" (1912); "Concert Pitch" (1913); "Full Swing" (1914). She died in 1916.

DANCING, a form of exercise or amusement in which one or more persons make a series of graceful movements in measured steps in accord with music. Aristotle ranked dancing with poetry and Pindar applies the name of "The Dancer" even to Apollo. Dancing corresponds to a universal primitive instinct in man, and is practiced by the South Sea Islanders, the Forest Indians of Brazil, the Zulus, the negroes of central Africa, and the native Australians, exactly as it was in the earlier stages of every civilized modern race. Ferocious war dances were practiced by savage warriors, as the North American Indian braves, who brought on a frantic mechanical intoxication capable of carrying them to victory. The Zulu war dance is a noble exercise for warriors, like the Pyrrhic dance of the ancient Spartans; and the dancing and spinning dervishes in the East, who work themselves into spasms of physical excitement, are still highly esteemed for devoutness and piety. The idea of magic always enters into savage dancing.

The art of dancing dates back to the early Egyptians, who ascribe that invention to their god Thoth. Among the ancient Jews, Miriam danced to a sound of trumpets, itself an act of worship, and David danced in procession before the Ark of God. Religious processions went with song and dance to the temples; the Cretan chorus moving in measured pace sang hymns to the Greek god Apollo, and one of the Muses (Terpsichore) was the especial patroness of the art. The Spartans practiced dancing as a gymnastic exercise and made it compulsory on all children from the age of five. The Romans in general considered it disgraceful for a free citizen to dance except in connection with religious rites, but willingly witnessed the performances of professional dancers. The early Christians practiced choral dances, which came into discredit with the love-feast or Agapæ. A survival of religious dancing is still seen even within the pale of Christendom, where during the Corpus Christi octave a ballet is danced every evening before the high altar of Seville Cathedral by boys from 12 to 17 years of age, in plumed hats and the dress of pages of Philip III.'s time.

The Puritan ancestors saw deadly sin in promiscuous dancing. Many of the mediæval dances were solemn and stately in character. Dancing reached its height during the reign of Louis XIV., who was himself an enthusiastic dancer in the court ballets.

The minuet was a favorite in France for a century; and then came the quadrille or contre-danse, often connected erroneously with the English country-dance; the Écossaise was first introduced in 1760; the galop was introduced from Germany; the cotillion was fashionable under Charles X.; polka was first danced at the Odéon in 1840 by a dancingmaster from Prague; the polka tremblante or schottisch, was of Bohemian origin and was first brought out in Paris in 1844; the lancers was introduced by Laborde in 1861; and the waltz, originally Bavarian, and now modified from its original form, promises to retain its supremacy. Though the French provide the world with fashions, people have preserved their own old national dances and these are still danced universally. In recent years, however, a notable change has taken place in this respect. Many of the old dances have fallen into disuse.

Characteristic of particular races or merely of classes of people are such forms of the dance as the Scotch reel, Highland fling and strathspey, the Irish jig, the negro break-downs, sailors' hornpipe, step-dances, the can-can, morris dances, etc.

A ballet is a theatrical exhibition composed of dancing, posturing, and pantomimic action. The Roman pantomimes bore a strong resemblance to the modern ballet d'action. In an entertainment given to celebrate the victory of Actium, the "Trachiniæ" of Sophocles, and an erotic interlude founded on the myth of Leda, were performed in dumb show, the dancers Pylades and Bathyllus taking the leading parts; and the whole wound up with a Pyrrhic war-dance. Some tradition of this form of entertainment, doubtless, suggested the courtly dances which became fashionable in the early days of the Renaissance. The first on record was that given by Bergonzio di

Botta, at Tortona, to celebrate the marriage of the Duke of Milan in 1489. This was famous throughout the civilized world. From that time great events, such as royal marriages and births, were celebrated by grand productions of ballet on which enormous sums of money were lavished. These ballets were frequently historical in subject, treating of the Siege of Troy, the Conquests of Alexander, and similar events. There were also mythological, poetical, moral, and fantastic ballets, on such subjects as the Judgment of Paris, the Seasons, Truth, the Diversions of the Carnival, etc. All these were in five acts, each of which consisted of three, six, nine, or twelve entries, and in all of them singing and recitation mingled with the dancing.

Catherine de Medici introduced the ballet into France, and encouraged dances by females that would now be deemed highly improper, to distract the attention of her son, Henry III., from state affairs. Henry IV. was a great supporter of the ballet, no fewer than 80 grand entertainments being given by him between 1589 and 1610. Louis XIII. and Louis XIV. carried their love of ballet to an extreme length, and themselves danced publicly. In 1661 the latter founded an Academy of the Dance, with Quinault as director, and Lully as composer. It was not until 1681 that female dancers appeared in public, the first being four ladies, who danced "La Triomphe de l'Amour." In the early part of the 18th century the names of professional dancers begin to appear, two of the most famous being Mlles. Salle and Camargo, immortalized by Voltaire. The great male dancer of this time was Dupré, the predecessor of the universally known Gaetano Vestris.

In 1697 De la Motte introduced more changes into the ballet, chiefly in the direction of more interesting subjects, and about the same time comic ballets were invented by Danchet; but no important alterations were made till the advent of Jean George Noverre in 1749. The dancers wore masks, huge wigs and headdresses, and hoops. The mask finally disappeared in 1773. Hitherto the form of the ballet had remained practically unchanged, each act being performed by different dancers, and generally in different styles of dancing. Noverre invented the ballet d'action, and revived the art of pantomime. Dancing now had dramatic meaning, and the most intricate plots were represented by pantomime alone. The principles of Noverre were carried to great perfection by Vincenzo Galleotti in Copenhagen, and by his successor, Bournonville. Under the Directory a form of grand ballet was revived, in which patriotic songs were a distinctive feature.

The history of the ballet since Noverre's time is a history of dancers rather than of dancing. In England, this class of entertainment was never more than an exotic, and has practically no history. The word *balette* is first used in English by Dryden (1667), and the earliest attempt at a descriptive ballet seems to have been "The Tavern Bilkers," played at Drury Lane in 1702. Within the last few years an important revival of the ballet has taken place in Italy, where the famous "Excelsior," by the Chevalier Luigi Manzotti, Messalina, Amor, etc., have furnished magnificent examples of the ballet d'action.

Skirt-dancing, so-called on account of the voluminous skirts made of sheer or flimsy material, which are worn by the dancers and play so important a part in their dances, has become a science and a popular attraction on the stage. The dancers, by the clever manipulation of their draperies and assisted by light effects, assume such forms as flowers; the rose, calla lily, pansies, pinks; butterflies of different colors, and flags of various nationalities; all to the accompaniment of music. Among the most noted skirt dancers were Amelia Glover, Loie Fuller, the inventor of the serpentine dance, Papinta, and Anna Held.

The beginning of the twentieth century saw a great revival in the popularity of dancing, both in spectacular and individual dances. Interpretive dancing also was developed by many foreign and American artists. Russian dances became especially popular in the United States and elsewhere. Among the most famous of the Russian dancers were Mme. Pavlowa and Michael Fokine. Mr. and Mrs. Vernon Castle introduced in the United States a variety of dances which became exceedingly popular, and for a time dancing became well-nigh an epidemic. Various dances, some of them derived from the barbaric dances of savage tribes, were found so objectionable that they were suppressed. The late development of the dance was the so-called jazz, which developed in a large variety of forms.

Dancing became one of the courses in the public schools and children were instructed in folk and interpretive dances on a large scale.

DANCOURT (don-kör'), properly FLORENT CARTON, a French playwright and dramatic artist; born in Fontainebleau in 1661. His best low comedies or farces were: "The Fashionable Chevalier"; "The Winsome Gardener." He presented village life with perfect truth,

and was master of village *patois*. He died in 1725. Voltaire ranked him next after Molière for low comedy.

DANDELION, the common and well-known plant, *Taraxacum Dens Leonis* or *officinale*, belonging to the natural order *Compositæ*. It yields a milky juice, which in the form of extract is used medicinally as a diuretic and alterative. It contains a bitter crystalline principle called taraxacine. Its root has been used to adulterate coffee in a similar way to chicory. It has a naked, hollow stalk, with a single bright yellow flower. The blanched leaves are used as a winter salad, and the roots are eaten as such by the French. The seed is furnished with a fine white pappus, by means of which it is carried far and wide by the wind. The leaves are lanceolate and sinuous, rising from a tap-root in the form of a rosette.

DANDOLO (dän'dō-lō), a patrician family of Venice, which traced its origin to the Roman era. Its most illustrious member was:

DANDOLO, ENRICO, Doge of Venice, to which high office he was chosen in 1192, when in his 87th year. He carried on the war with the Pisans and closed it by an advantageous peace. In 1201 the Crusaders applied to him for assistance, and on their promise to reduce the town of Zara, which had revolted, he agreed to help them. He accordingly undertook with them, in 1203, the siege of Constantinople, at which he greatly distinguished himself, and was the first who leaped on shore. It is said that he had the offer of the imperial crown, and refused it. He was created despot of Rumania, and died 1205, at the age of 97.

DANEBROG ("the Danish banner"), the name of the second in dignity of the Danish orders instituted by King Waldemar in 1219.

DANELAGH (dān'lâ), the portion of England allotted to the Danes by the Treaty of Wedmore in 878 A. D. It extended from the E. coast to a line which ran from the Thames a little below London to Chester on the Dee.

DANES. See DENMARK.

DANIEL, the prophet, a contemporary of Ezekiel; was born of a distinguished Hebrew family. In his youth, 605 B. C., he was carried captive to Babylon, and educated in the Babylonish court for the service of King Nebuchadnezzar. Thrown into the lions' den for conscientiously refusing to obey the king, he was miraculously preserved, and finally made prime-minister in the court of the Persian king Darius. He ranks with what are called the "greater prophets." The book of the Old Testament which bears his name is divided into a historical and a prohetic part. Modern criticism generally regards it as written during the oppression of the Jews under Antiochus, about 170 B. C. It is partly in Chaldee.

DANIELL, MOSES GRANT, an American educator, born in Boston in 1836. He graduated from Harvard in 1863 and entered the field of secondary education, in which he held a prominent part for over thirty years. He first served with the Everett School in Dorchester, and then for seventeen years was instructor of Latin in the Roxbury Latin School. For twelve years he was Headmaster of the Chauncy Hall School in Boston. His textbook, written with William C. Collier, is widely used in the early study of Latin.

DANIELS, JOSEPHUS, an American public official, born in 1862 in Washington, N. C. He became, in 1880, editor of the "Advance," a newspaper of Wilson,



JOSEPHUS DANIELS

N. C. Although he studied law and was admitted to the bar he never practiced that profession, preferring newspaper work. In 1885 he became editor of the "State Chronicle" of Raleigh and in 1894 united this newspaper with another and published it as the "News and Observer." From 1887 to 1893 he was State printer.

From 1895 to 1912 he was prominent in National and State politics as a Bryan Democrat and took a considerable part in the election of Wilson to the presidency in 1912. In March of the next year he received the appointment of Secretary of the Navy. He gained prominence by his order forbidding officers to have liquor aboard their vessels and by banning the use of liquor by the officers and men of the navy. He also advocated government manufacture of armor and munitions. During the war with Germany the navy of the United States did its work effectively, and this was due largely to the efforts of Secretary Daniels. A controversy between him and Admiral Sims, as a result of the latter's criticism of navy administration during the war was followed by a Senatorial investigation in 1920.

DANIELS, WINTHROP MORE, an American official and economist, born in Dayton, O., in 1867. He graduated from Princeton in 1888. After studying in Germany, he became professor of political economy in Princeton in 1892, serving until 1911. In the latter year he was appointed a member of the Board of Public Utility Commissioners of New Jersey. He served in this capacity until 1914, when he became a member of the Interstate Commerce Commission. He was a chairman of the Commission in 1918-1919. He was the author of "Elements of Public Finance" (1899); and "Continuation of Alexander Johnston's History of American Politics" (1902). He was a contributor to magazines on economic subjects.

DANITE, a member of a former Mormon secret society whose purpose it was to avenge wrongs committed by the "Gentiles" on the "Saints." They are said to have been organized about 1837. They derive their name from Jacob's blessing to his son Dan (Gen. xlix: 17).

DANNEMORA, a village on a lake of the same name, 24 miles N. N. E. of Upsala, in Sweden, celebrated for its iron-mines, the second richest in Sweden, which have been worked uninterruptedly for upward of three centuries.

DANNEVIRKE (Danes work), the rampart built by the Danes about 808 across Sleswick, just N. of the Eider; the scene of fighting in 1849, and razed by the Germans in 1850.

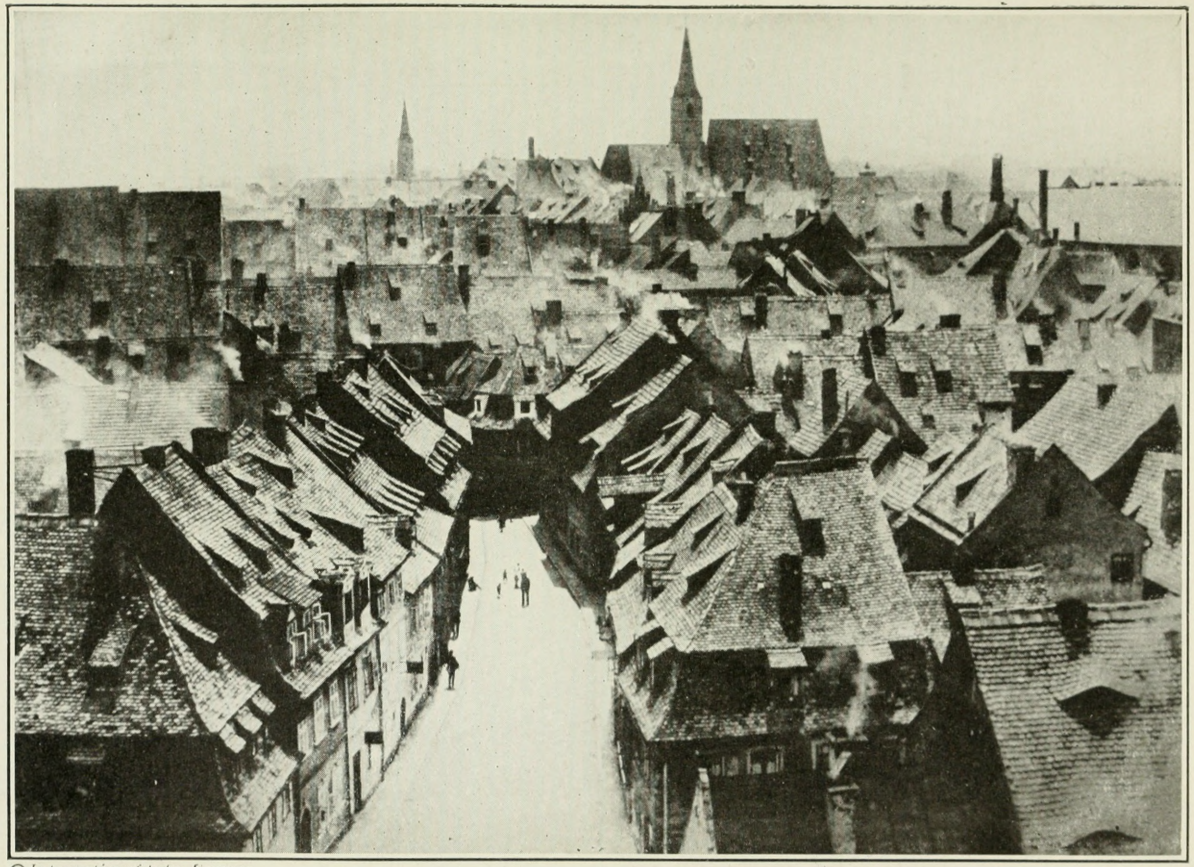
D'ANNUNZIO, GABRIELE (dän-ön'tsē-ō), an Italian novelist and poet; born at sea in 1864. He studied law in Pisa, but in 1885 took up literature. He wrote "Italy" and other poems, besides novels of pessimist tendency. "The Triumph of Death," published 1895, won him international fame. In 1899 he was elected to the Italian Chamber of Deputies. When Italy entered the World War he enlisted in the Aviation Corps, was promoted to a lieutenancy and received the croix de guerre for bravery. After the Peace of 1919, dissatisfied with the



GABRIELE D'ANNUNZIO

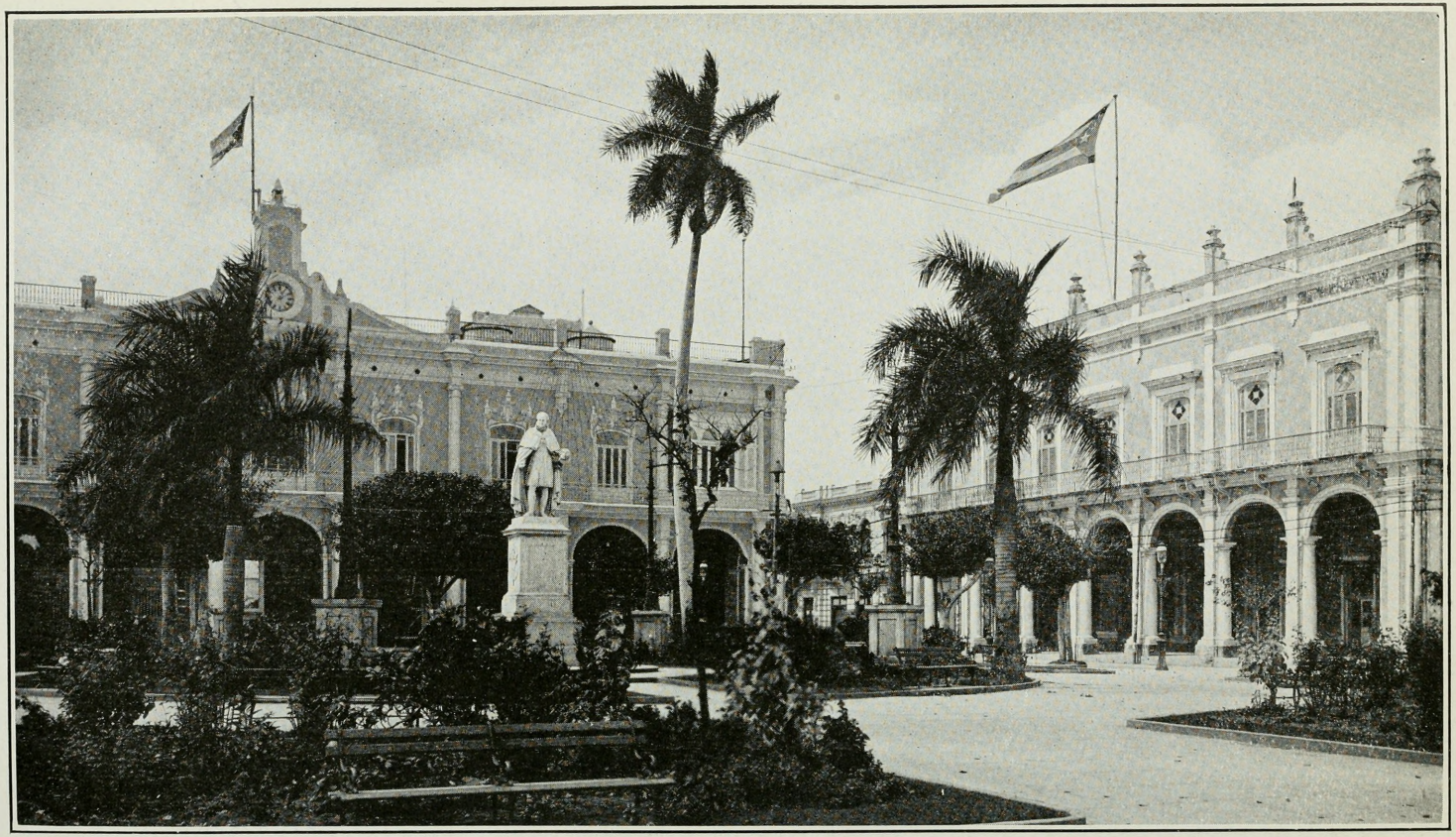
award of Fiume to Jugoslavia, and supported by some military and naval contingents, he took possession of the city and instituted a local government. On Sept. 9, 1920, he proclaimed Fiume an independent state, but abandoned the city of Fiume in December, following the agreement of Rapollo. He was the author of many successful plays. Notable are "The Dead City) (1898); "La Gioconda" (1898); "Francesca da Rimini" (1901); "Juno's Daughter" (1904); "Fedra" (1909). His later fiction includes "Novella della Pescara" (1902); "Le Chèvrefeuille" (1913), etc.

DANTE, ALIGHIERI (dän'tā ä-lē-gē-ā'rē), the greatest of Italian poets; born in Florence about the end of May, 1265, of a family belonging to the lower nobility. His education was confided to the learned Brunetto Latini. He is said also to have studied in various seats of learning. He seems to have been quite a boy, no more than 9 years of age, when he first saw Beatrice Portinari, and the love she awakened in him he has described in that record of his early years, the "New Life," as well as in his later great work, the "Divine Comedy." Their lives were spent far apart, Beatrice marrying a noble Florentine, Simone Bardi, in 1287, and dying three years afterward; while the year following Dante married Gemma dei Donati, by whom he had seven children.



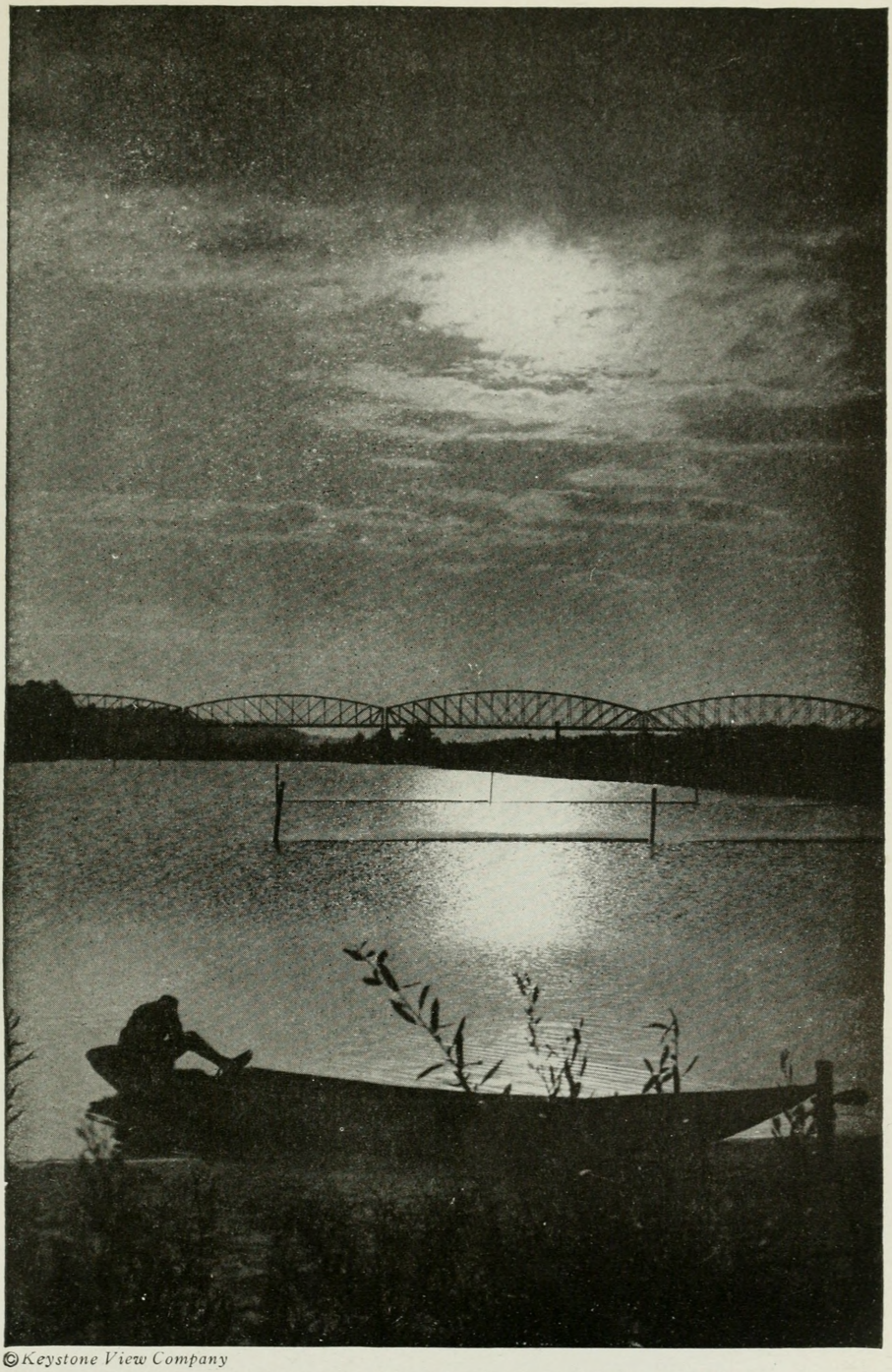
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PICTURESQUE ARCHITECTURE OF THE TOWN OF EGER, IN CZECHO-SLOVAKIA



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THE PLAZA DES ARMES, HAVANA, CUBA, WITH THE CUBAN FLAG FLYING OVER THE PUBLIC BUILDINGS



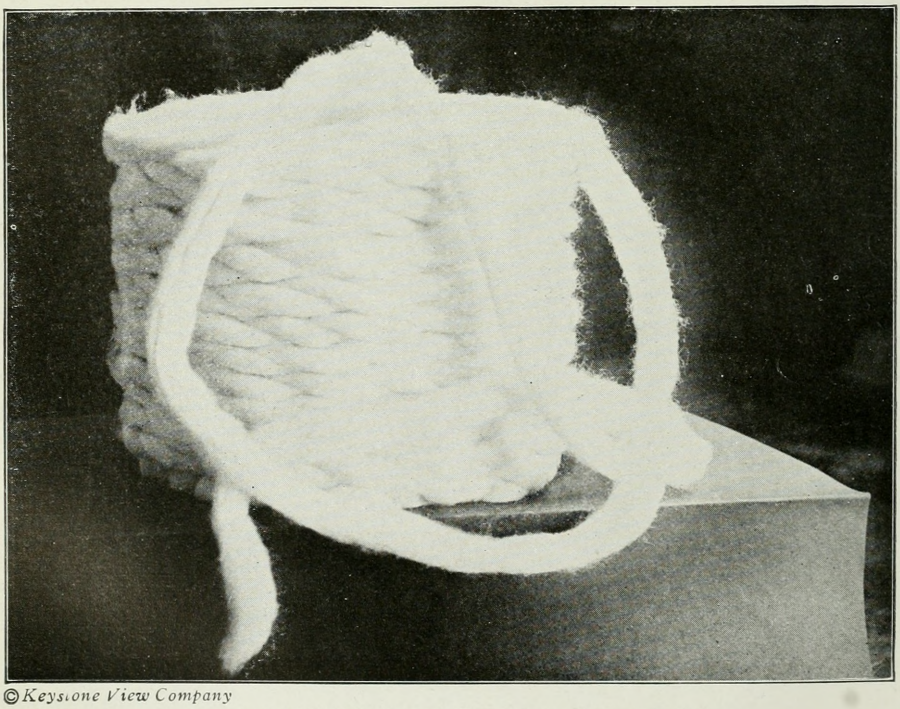
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THE DANUBE RIVER AND THE BRIDGE FROM WACHAU TO KREMS



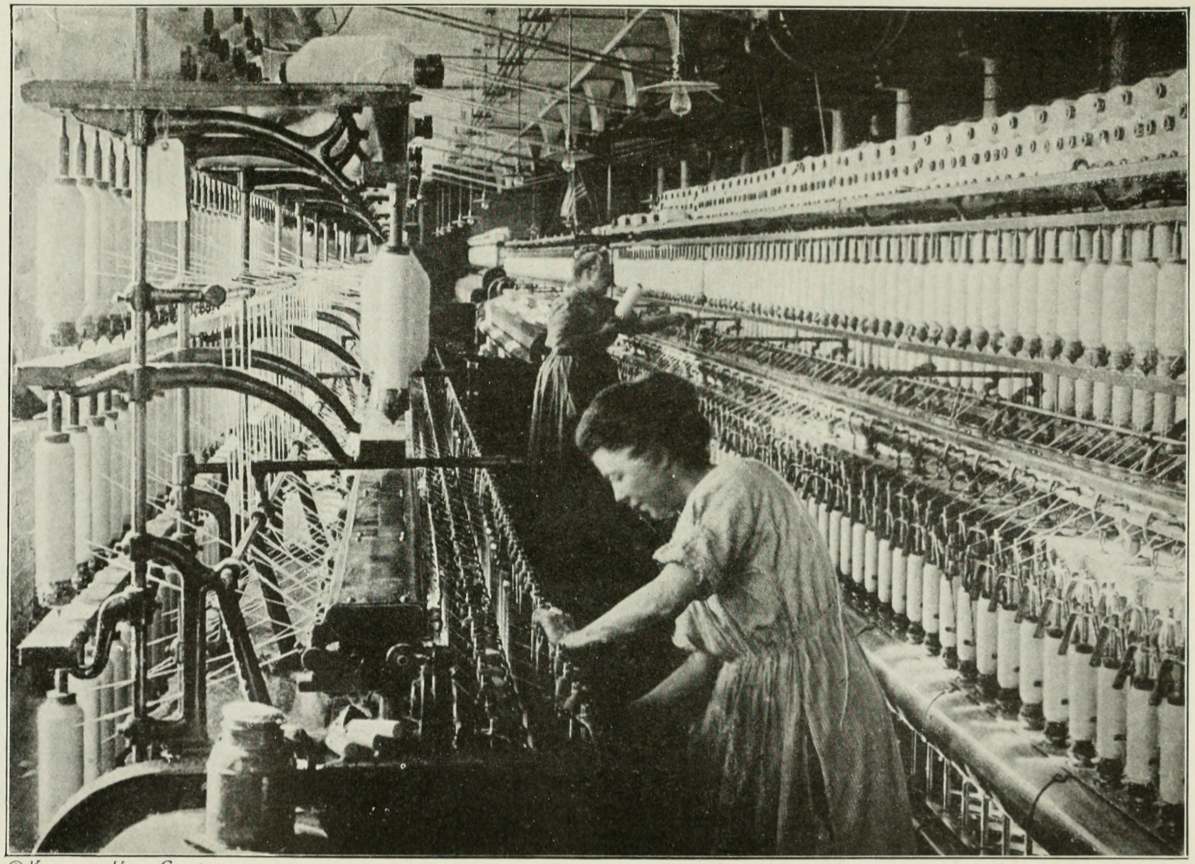
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SORTING RAW COTTON IN A COTTON FACTORY



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CARD SLIVER READY FOR USE IN A COTTON MILL



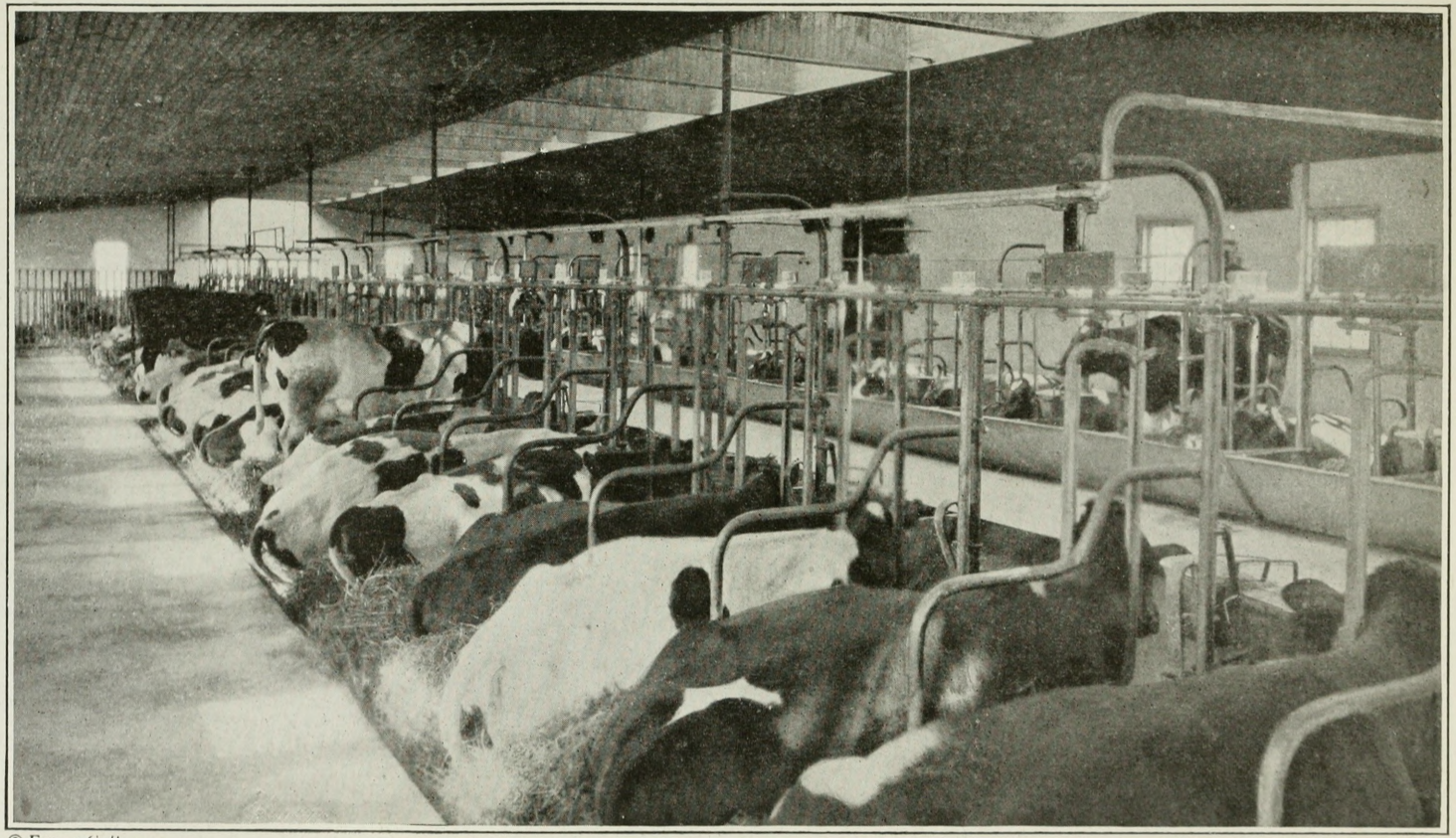
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A COTTON MILL INTERIOR, SHOWING THE ROVING FRAMES WHERE THE SLIVER OR CARDED FIBER IS TWISTED



©Keystone View Company

COLOR MIXING IN A COTTON FACTORY



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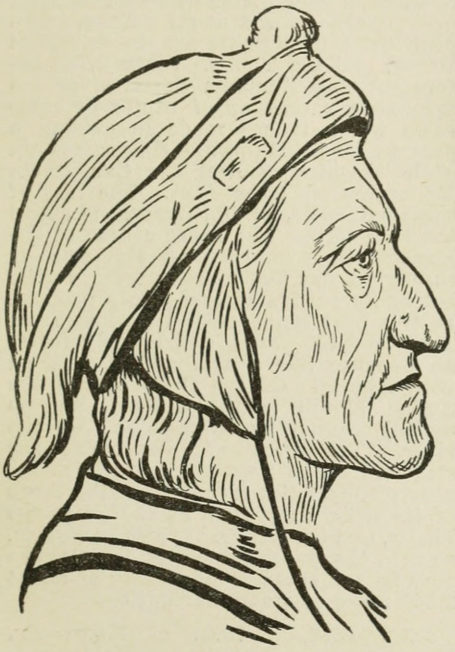
A MODEL DAIRY BARN IN NEW JERSEY



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DATE PALMS ALONG THE RIVER NILE

At this time the Guelfic party in Florence became divided into the rival factions of Bianchi and Neri (Whites and Blacks), the latter being an extreme papal party, while the former leaned to reconciliation with the Ghibellines. Dante's sympathies were with the Bianchi, and being a prior of the trades and a leading citizen in Florence, he went on an embassy to Rome to influence the Pope on behalf of the Bianchi. The rival faction of the Neri, however, had got the upper hand in the city, and in the usual fashion of the time were burning the houses of their rivals and slaying them in the open street. In Dante's absence his enemies obtained a decree of



DANTE

banishment against him, coupled with a heavy fine, a sentence which was soon followed by another condemning him to be burned alive for malversation and peculation. From this time the poet became, and to the end of his life remained, an exile. He has told us himself how he wandered "through almost all parts where this language is spoken," and how hard he felt it "to climb the stairs and eat the bitter bread of strangers." During this period he is said to have visited many cities, Arezzo, Bologna, Sienna, etc., and even Paris. In 1314 he found shelter with Can Grande della Scala at Verona, where he remained till 1318. In 1320 we find him staying at Ravenna with his friend Guido da Polenta. In September, 1321, his sufferings and wanderings were ended by death. He was buried at Ravenna, where his bones still lie.

His great poem, the "Divine Comedy," written in great part, if not altogether, during his exile, is divided into three parts, entitled "Hell," "Purgatory," and "Paradise." The poet dreams that he has wandered into a dusky forest, when the shade of Vergil appears and offers to conduct him through hell and purgatory. Farther the pagan poet may not go, but Beatrice herself shall lead him through paradise. The journey through hell is first described, and the imaginative power with which the distorted characters of the guilty and the punishments laid on them are brought before us; the impressive pathos of these short histories—often compressed in Dante's severe style into a couple of lines—of Pope and Ghibelline, Italian lord and lady; the passionate depth of characterization, the subtle insight and intense faith, make up a whole which for significance and completeness has perhaps no rival in the work of any one man. From hell the poet still in Vergil's company ascends to purgatory. There are scenes of surpassing beauty and grandeur when with Beatrice he enters the celestial paradise and they wander through the nine spheres.

There are English versions of the great poem by Cary, Longfellow, and Parsons - Norton (1891-1892). Dante's other works are: "The Banquet," a series of philosophical commentaries on the author's canzoni; "The Canzon Writer's Art," a collection of poems; a Latin treatise, "Concerning Monarchy," a work intended to prove the supremacy of the head of the Holy Roman Empire, a treatise on the Italian language, entitled "On Popular Speech"; and an inquiry into the relative altitude of the water and the land, "Land and Water."

DANTON, GEORGES JACQUES, a French revolutionist; born in Arcis-sur-Aube, Oct. 26, 1759. He was an advocate by profession, but became one of the most active among the demagogues of the Revolutionary period. After the imprisonment of Louis XVI, at Varennes, he took the lead in the meeting of Champ-de-Mars, which paved the way to the dethronement of the king. Danton's burly figure, stentorian voice, courage and self-confidence fitted him to dominate the revolutionists. He became one of the executive council and took active measures to defend Paris, threatened by the Prussians under the Duke of Brunswick. He was afterward a member of the Convention and of the Committee of

Public Safety, and was a chief promoter of all the sanguinary acts of that terrible period. At length a struggle for supremacy took place between him and Robespierre, in which the latter was successful, when Danton was sent to the guillotine, April 5, 1794.



DANTON

DANUBE, a celebrated river of Europe, originates in two small streams rising in the Schwarzwald, or Black Forest, in Baden, and uniting at Donaueschingen. The direct distance from source to mouth of the Danube is about 1,000 miles, and its total length, including windings, about 1,725 miles. From its source the Danube flows in a N. E. direction to Ulm, in Württemberg, where it becomes navigable for vessels of 100 tons; then to Ratisbon, in Bavaria, where it becomes navigable for steamers. Here it turns in a S. E. direction, entering Austria at Passau, passing Vienna and Budapest, above which latter town it suddenly turns due S., holding this direction till it is joined by the Drave, after which it runs S. S. E. and enters Servia at Belgrade. Continuing its general course E., it forms for a long distance the boundary line between Rumania and Bulgaria. At Silistria it once more turns N., and flowing between Rumania and Bessarabia falls into the Black Sea by three different outlets. In the upper part of its course, through Württemburg and Bavaria, the Danube flows through some of the most fertile and populous districts of its basin. Its principal affluents here are the Iser and Lech.

In Austria it passes through a succession of picturesque scenery till past Vienna, the land on both sides being well peopled and cultivated. The principal affluents are the March, or Morawa, and the Enns. After passing through what is called the Carpathian Gate, at Pressburg, where it enters Hungary, it gives off a number of branches, forming a labyrinth of islands known as Schütten, but on emerging it flows uninterruptedly S. through wide plains interspersed with pools, marshes, and sandy wastes. The principal affluents here are the Save, the Drave, and the Theiss. Sixty miles before entering Rumania the river passes through a succession of rapids or cataracts which it has made in cutting a passage for itself through the cross chain of hills which connect the Carpathian Mountains with the Alps. The last of these cataracts, at Old Orsova, is called the Iron Gate. The lower course of the Danube, in Rumania and Bulgaria, is through a flat and marshy tract, fertile but badly cultivated and thinly peopled. In this part it increases its width from 1,400 to 2,100 yards, and latterly forms an expanse like a sea, and is studded with islands. Of the three outlets the Sulina Mouth is the deepest, and is usually chosen by ships bound up the river. The Danube is navigable for steamers up to Regensburg (Ratisbon), nearly 1,500 miles from its mouth. Some of its tributaries, such as the Save, the Theiss, and the Drave, are also navigable, so that the water system of the Danube may be estimated as admitting of about 2,500 miles of steam navigation.

DANVERS, a town of Essex co., Mass.; on the Boston and Maine railroad; five miles N. W. of Salem. It was a portion of Salem till 1756, and embraces the Salem village parish where the witchcraft excitement broke out. It is the seat of Peabody Institute, founded by George Peabody, a resident of the place, who in 1852 donated $200,000 for the promotion of knowledge and morality among the inhabitants. It is also the seat of Danvers Insane Asylum, built at a cost of $2,000,000, and has extensive manufactures of shoes, bricks, and carpets, foundries, rolling mills, tanneries, churches, high school, weekly newspapers, public library, and National bank. Pop. (1910) 9,407; (1920) 11,108.

DANVILLE, a city and county-seat of Vermilion co., Ill.; on the Vermilion

river, and the Wabash, Chicago, and Eastern Illinois, the Chicago, Indiana and Southern and the "Big Four" railroads; 125 miles S. of Chicago. It has a National Soldiers' Home for Disabled Veterans, with over 3,500 immates. Its chief industry is coal-mining, which is carried on extensively on the bluffs of the river. It also has large railroad car and machine shops, iron foundries, planing mills, carriage and wagon factories, organ and furniture factories, churches, a high school, 5 National banks, and daily and weekly newspapers. Pop. (1910) 27,871; (1920) 33,776.

DANVILLE, a city and county-seat of Boyle co., Ky.; on Dick's river, and the Queen and Crescent and Southern railroads; 42 miles S. of Frankfort. It is a stock-raising center, and the seat of several educational institutions, among them the Danville Theological Seminary, the Central University of Kentucky, Kentucky College for women and the State Asylum and School for Deaf Mutes. It has churches, public schools, 2 National banks and newspapers. Pop. (1910) 5,420; (1920) 5,099.

DANVILLE, a borough and county-seat of Montour co., Pa.; on the Susquehanna river, and the Lackawanna, the Philadelphia and Reading and the Pennsylvania railroads, 154 miles N. W. of Philadelphia. Danville is in a district abounding with iron-ore, limestone, and anthracite coal; and contains the first establishment erected in the United States for the manufacture of railroad iron, and still ranks among the most extensive in the country. There are blast furnaces, iron foundries, rolling mills, churches, 2 National banks, a State asylum for the insane, and daily and weekly newspapers. Pop. (1910) 7,517; (1920) 6,952.

DANVILLE, a city and county-seat of Pittsylvania co., Va.; on the Dan river, and the Southern railroad, 140 miles S. W. of Richmond; is the seat of Randolph-Macon College, Roanoke Institute, and Danville School for Boys. It has good water-power, cotton mills, flour mills, grist mills, foundry, and tobacco factories. It is the center of the fine yellow tobacco section, and 30,000,000 pounds of leaf-tobacco are sold annually. It has a high school, water works, newspapers and 2 National banks. Pop. (1910) 19,020; (1920) 21,539.

DANZIG, a fortified town and port, Prussia, capital of the province of West Prussia, 253 miles N. E. of Berlin, on the left bank of the W. arm of the Vistula, about three miles above its mouth in the Baltic, and intersected by the Mottlau, which here divides into several arms. It is one of the most important seaports in the Prussian republic. The more modern parts are regularly and well built; in the other parts the streets are narrow and the houses old and indifferent. Among the principal buildings are the Dom or Cathedral, begun in 1343, the Church of St. Catharine, the exchange, the arsenal, observatory, three monasteries, two synagogues, two theaters, etc. The industries are numerous, but excepting those connected with shipbuilding, artillery, and beer, not of great importance. The prosperity of the town is founded chiefly on its transit trade, particularly in wheat from Poland. There is also a considerable trade in amber. The proper port of Danzig is Neufahrwasser, at the mouth of the Vistula; but vessels of large size can now come up to and enter the town. After being alternately possessed by the Teutonic knights and the Poles, Danzig, on the partition of Poland, fell to the lot of Prussia. By the Treaty of Versailles, Danzig was made with the surrounding territory a free city under the protection of the League of Nations, which appoints a high commissioner. It has a legislative Council, and universal suffrage. Danzig serves as a corridor by which Poland has access to the sea. Pop. (1919) 162,468.

DAPHNE, a genus of plants belonging to the *Thymelæaceæ*. Orifice of the calyx without appendages, stamens 8 to 10, inclosed within the calyx, stigma simple, fruit succulent. *D. laureola* is the spurge laurel. It is an evergreen. *D. mezereum* has deciduous leaves and very fragrant flowers. They are all found in the temperate districts of Asia and Europe. The bark of the root, as well as that of the branches, of *D. mezereon* is used in decoction as a diaphoretic in cutaneous and syphilitic affections. In large doses it is an irritant poison, causing hypercatharsis. Used externally it acts as a vesicant. It contains a ventral crystalline principle, called daphnein. The fruit is poisonous. The barks of *D. gnidium*, *D. alpina*, *D. cneorum*, *D. pontica*, and *D. laureola* have similar properties. The berries of the last are poisonous to all animals except birds. The inner bark of *D. lagetta*, when cut into thin pieces after maceration, assumes a beautiful net-like appearance, whence it has received the name of lace-bark.

DAPHNIA, a genus of *Entomostraca* order *Cladocera*, family *Daphniadæ*. *D. pulex* is the common water-flea. The head is large, rounded above and in front; superior antennæ very small; the

head produced into a more or less prominent beak; eye spherical, with about 20 lenses; jaws composed of a strong body ending in four horny spines, three of which curve inward. The antennæ act as oars, by which the animals project themselves by a series of jerks through the water. They are frequently very numerous in ponds and ditches, which they often color, especially when the water is stagnant, with an appearance of blood. *D. pulex* is a favorite and interesting microscopic object.

DARBHANGAH (där-bän'gä), the chief town of Darbhangah district, in Behar province, India; on the Little Baghmati river, 78 miles N. E. of Patna by rail. It has large bazaars and a handsome market-place, extensive tanks, a hospital and the maharajah's palace, with fine gardens, menagerie, and aviary. There is an active trade in oil-seeds, food-grains, timber, salt, iron, lime, etc. Pop. (1901) 66,244.

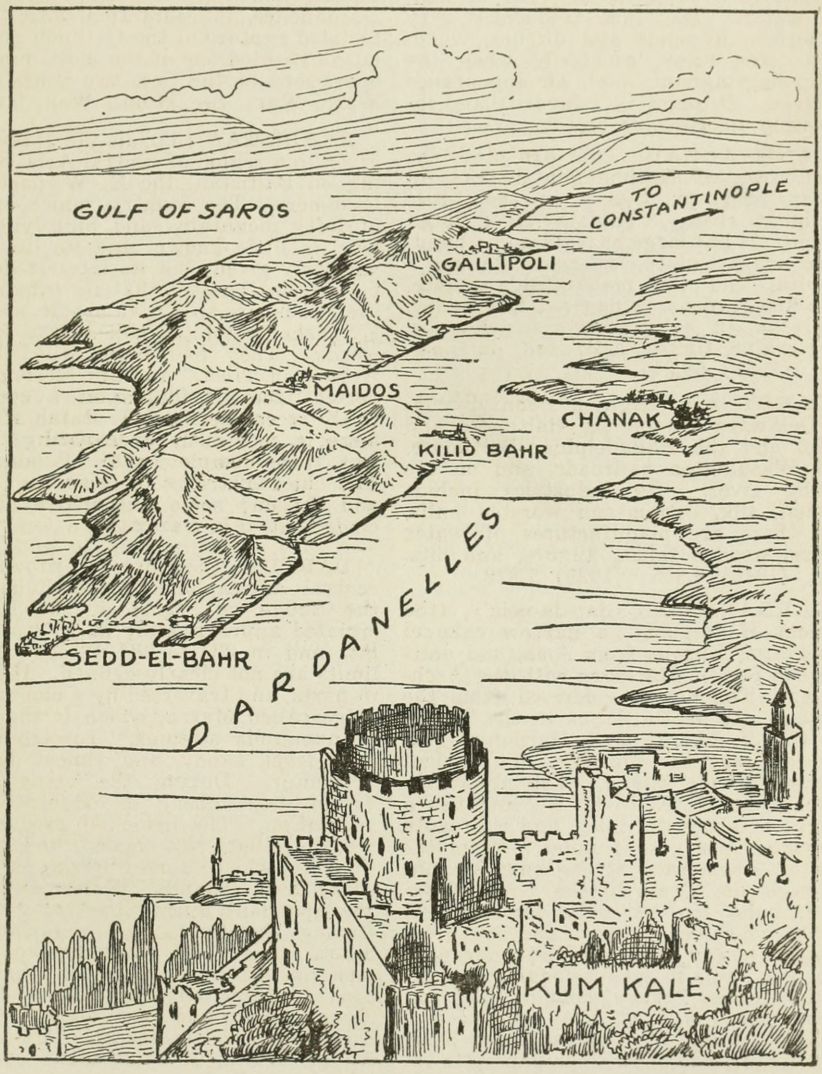
DARBY, a borough in Pennsylvania, in Delaware co., on the Baltimore and Ohio, and the Philadelphia, Baltimore, and Washington railroads, and on the Darby river. Its industries include woolen, silk, cotton and worsted mills, and there are manufactures of water filters, wooden tanks, augurs, and bits. Pop. (1910) 6,305; (1920) 7,922.

DARDANELLES (dar-da-nelz'), (the ancient Hellespont), a narrow channel separating Europe from Asia, and uniting the Sea of Marmora with the Archipelago. The name is derived from the ancient city of Dardanus in the Troad, on the S. shore; and Dardanus was named from the Dardani, an ancient people farther inland. The strait extends from N. E. to S. W., and has a length of about 40 miles, and a breadth varying from 1 to 4 miles. From the Sea of Marmora a strong current runs through the strait to the Archipelago. Both sides are strongly fortified. A treaty concluded between the five great powers and Turkey in 1841 arranged that no ship of war belonging to any nation save Turkey should pass the Dardanelles without the express consent of Turkey; all merchant-ships being also required to show their papers to the Ottoman authorities. These provisions were confirmed at London in 1871 and at Berlin in 1878, in February of which year a British fleet had sailed into the Sea of Marmora. The Dardanelles is celebrated in ancient history on account of Xerxes and Alexander having crossed it, the former in 480 B. C. to enter Europe; and the latter in 334 B. C. to enter Asia. The point at which Xerxes crossed, by two separate bridges, was in the neighborhood of Abydos, on the Asiatic shore, opposite to Sestos. Alexander crossed at nearly the same place; and here also young Leander nightly swam across to visit Hero—a feat performed in 1810 by Lord Byron. The attempt by British and French fleets to force the Dardanelles, in connection with the attempted capture of the Gallipoli peninsula, constituted one of the most important operations of the first two years of the World War. See WORLD WAR; TURKEY.

DARDISTAN (där-dis-tän'), the name given to a region of central Asia, bordering on Baltistan, the N. W. portion of Cashmere. The country, which consists of lofty mountains and high-lying valleys, is little known, and its limits are variously given; but its interest depends mainly on the fact that its inhabitants, the Dards, are an Aryan people, speaking a Sanskritic tongue mixed with Persian words. They had been called "Stray Aryans in Tibet," and are Moslems converted from Buddhism at a comparatively recent period: the Rajah of Cashmere is constantly endeavoring to subject them completely to his authority. The chief districts are Hasora, Gilghit, and Tassin; some authorities also include Chitral in Dardistan.

DARFUR (där'för), a province of central Africa, one of the divisions of the Sudan or "Land of the Blacks," situated approximately in 10° to 16° N. lat., and in 22° to 28° E. lon.; but its limits are not clearly defined. It is hilly in parts, and traversed by a mountainous ridge called Marra, which is the source of numerous streams. Toward the N. it is level, sandy, and almost destitute of water. During the rainy season (June—September) it exhibits a rich vegetation. The principal products are wheat, millet, rice, maize, and sesame. Tobacco, which is used by the natives in every form, abounds. Watermelons, also, are abundant during the rainy season. Among the fruits are tamarinds and dates. The chief minerals are copper and iron. The wealth of the inhabitants consists principally in cattle. Horses, sheep, camels, and game abound. Darfur carries on a considerable trade with Egypt, Mecca, and the inland countries of Africa; it was a notorious center of the slave trade. The Fulbes are an intelligent, well-built race, and have long been Mohammedans; their numbers are variously estimated at from 3,000,000 to 4,000,000. Kobbe is the chief trading town. In 1900 Darfur and Kordofan were within the sphere of British influence, by an agreement between Great Britain, Germany, and Italy. See BRITISH EAST AFRICA.

D'ARGENSON, MARC PIERRE, COMTE (där-zhon-son'), a French statesman; born in 1696; the younger son of the Marquis d'Argenson (1652-1721), who created the secret police and established the *lettres de cachet*. He became war minister in 1743, at a time when the very political existence of France was imperiled, and by his vigor and lucky choice of generals changed the fortunes of the war. After the peace of Aix-la-Chapelle (1748), he devoted himself to the improvement of the military system, and in 1751 established the École Militaire. He was an illustrious patron of literature. In 1757 he was banished to his estate by the machinations of Madame Pompadour; but on her death he returned to Paris, where he died in 1764.



THE DARDANELLES

DARIEN, GULF OF, a gulf of the Carribbean Sea at the N. extremity of South America, between the Isthmus of Panama and the mainland.

DARIEN, ISTHMUS OF, often used as synonymous with the Isthmus of Panama, but more strictly applied to

the neck of land between the Gulf of Darien and the Pacific.

DARIUS THE MEDE (dā-rī'us), son of Astyages, King of the Medes, and brother of Mandane, mother of Cyrus, and of Amyit the mother of Evil-merodach and grandmother of Belshazzar; thus, he was uncle, by the mother's side, to Evil-merodach and to Cyrus. The Hebrew generally calls him Darius; the Septuagint, Artaxerxes; and Xenophon, Cyaxares. Darius dethroned Belshazzar, King of the Chaldeans, and occupied the throne till his death, two years after, when it reverted to the illustrious Cyrus.

DARIUS I., King of Persia, was the son of Hystaspes. He entered into a conspiracy, with six others, against the usurper Smerdis, and having slain him, they agreed that he should have the crown whose horse would neigh first in the morning. By a well-concerted plan of his groom, the horse of Darius neighed immediately after he came to the spot where they were to meet, in consequence of which he was saluted king. He took Babylon after a siege of 20 months, gave permission for the rebuilding of the temple of Jerusalem, and sent the captive Jews to their own country. The revolt of the Greek cities in Ionia was the occasion of the famous Persian war. The army of Darius, under the command of Mardonius, invaded Greece, but accomplished nothing. A second invasion was undertaken, and the Persians were defeated by the Greeks at Marathon; on which he resolved to carry on the war in person, but died in the midst of his preparation, 485 B. C.

DARIUS II., surnamed Ochus, or Nothus (bastard), was an illegitimate son of Artaxerxes. He ascended the throne of Persia after the assassination of Xerxes, and married Parysatis, his sister, a licentious and cruel woman, by whom he had Artaxerxes, Mnemon, Amistris, and Cyrus the Younger. He died in 405 B. C.

DARIUS III., surnamed Codomanus, the last King of Persia. His kingdom being invaded by Alexander the Great, he met him in person at the head of an army of 600,000 men. At the battle of Granicus the Persians were defeated, but met the Greeks again near Issus, where they were totally routed. Upward of 100,000 Persians were killed, and Alexander took, among the prisoners of war, the mother, wife, and children of Darius. Darius himself escaped in disguise and under cover of the night. Not discouraged by his reverses, he ventured another battle at Arbela, but was again defeated, and fled toward Media. Bessus, the governor of Bactriana, coveting his throne, attempted his life, and Darius was found by the Macedonians, in his chariot, covered with wounds and expiring. He died in 330 B. C.

DARJEELING, or **DARJILING**, a district of India, in the extreme N. of the lieutenant-governorship of Bengal; division of Cooch-Behar; area, 1,234 square miles. Tea, coffee, cinchona, and cotton are cultivated more or less, and the cultivation of the tea-plant and the making of tea is now the staple industry. Pop. about 250,000. DARJEELING, the chief town in the district, is a sanatory station for British troops, and though little more than 36 miles from the plains stands at an elevation of 7,400 feet above sea-level, on a ridge with deep valleys on either side, in a bleak but healthy situation. There is a residence of the lieutenant-governor, barracks, a sanitarium, etc. Pop. about 17,000, much increased in the hot weather.

DARK AGES, THE, a period supposed to extend from the fall of the Roman empire, A. D. 475, to the revival of literature on the discovery of the Pandects at Amalfi in 1137. Not to draw the limits too finely, say 700 years (450 to 1150). The Middle Ages may be extended to about 1550, covering from 10 to 11 centuries.

DARLEY, FELIX OCTAVIUS CARR, an American artist; born in Philadelphia, June 23, 1822. His illustrations of literary masterpieces gave pleasure to thousands and made him famous. His best work comprises his drawings to accompany the text of "Rip Van Winkle"; "Sleepy Hollow"; "Courtship of Miles Standish"; "Scarlet Letter"; "Evangeline"; the novels of Cooper, Dickens, and others, besides many special pictures. His book "Sketches Abroad with Pen and Pencil" (1868) is well known. He died in Claymont, Del., March 27, 1888.

DARLING, GRACE, an English heroine; born in the Longstone Lighthouse (Farne Islands, coast of Northumberland), of which her father was keeper, Nov. 24, 1815. In 1838 the steamer "Forfarshire," with 41 passengers on board besides her crew, became disabled off the Farne Islands during a storm, and was thrown on a rock, where she broke in two, part of the crew and passengers being left clinging to the wreck. Next morning William Darling descried them from Longstone, about a mile distant, but he shrank from attempting to reach the wreck. His daughter Grace persuaded him to make the attempt and to allow her to accompany him. Father and daughter rowed to the wreck and rescued nine per-

sons. Grace Darling's heroism was widely praised and a purse of $3,500 publicly subscribed was presented to her. She died Oct. 20, 1842.

DARLINGTON, JAMES HENRY, an American Protestant Episcopal bishop, born in Brooklyn in 1856. He graduated from New York University in 1877 and from the Princeton Theological Seminary in 1880. He was ordained priest in 1882. From 1883 to 1905 he was rector of Christ Church of Brooklyn. In the latter year he was consecrated first bishop of Harrisburg. He served as lecturer in New York University and as chaplain of the 47th Regiment of the New York National Guard. During the World War he was a member of the Committee on Public Safety in Pennsylvania and was head of the Serbian Relief Fund in the United States. He received several decorations from foreign countries for work done during the war. He was a member of many learned and patriotic societies. He wrote "Pastor and People" (1902) and published several volumes of sermons.

DARLINGTONIA, a genus of pitcher-plants, belonging to the order *Sarraceniaceæ* (sarraceniads). The *D. californica* grows in the N. part of California, chiefly in the district around Mount Shasta. It is found in boggy places, on the slopes of mountains. It entraps insects, which are attracted to the curious pitcher or hood at the extremity of the tubular leaves; and, once inside, are prevented by the fine hairs which point downward from again returning. The larva of a small moth, *Xanthoptera semicrocea*, preys on the plant, and that of a dipterous insect, *Sarcophaga sarraceniæ*, feeds on the dead insects which it incloses.

DARMSTADT (darm'stat), a town in Germany; capital of the republic of Hesse, in a sandy plain, on the Darm, 15 miles S. of Frankfort. It consists of an old and a new town. The former, which is the business part of the town, is very poorly built; the houses are old, and the streets narrow and gloomy. The new town is laid out with great regularity, and has handsome squares and houses. Among the remarkable buildings are the old palace (with a library of 500,000 volumes and 4,000 MSS., a picture gallery, and a rich museum of natural history), the Roman Catholic Church, and the Rathaus or town-hall built in 1580. Darmstadt before the World War had iron foundries, breweries, etc. Pop. about 90,000.

DARNEL, the popular name for *Lolium tenulentum*, which some suppose to be the *Infelix lolium* of Vergil and the *zizania* or tares of Scripture. It was believed by the ancients to be poisonous and narcotic. It is common in cornfields. It has culms one to two feet high, the spike being like that of *Triticum repens*, the wheat-grass or couch-grass.

DARNLEY, HENRY STUART, LORD, son of the Earl of Lennox and Lady Margaret Douglas, a niece of Henry VIII., and by her first marriage queen of James IV.; born 1541. In 1565 he was married to Mary Queen of Scots. It was an unfortunate match. Dislike developed open hatred, which the murder of Rizzio, to which Darnley was a party, served to increase. After Mary gave birth to a son, subsequently James VI, Darnley was seized at Glasgow with smallpox, from which he had barely recovered when Mary visited him, and had him conveyed to an isolated house called Kirk of Field, close to the Edinburgh city walls. This dwelling, which belonged to a retainer of Bothwell's, the rapidly rising favorite, was blown into the air with gunpowder, Feb. 10, 1567. The dead bodies of the king and his page were found in a field at a distance of 80 yards from the house, quite free from any mark which such an explosion would cause. Strong circumstantial evidence points to Bothwell as the murderer, and to Mary as an accomplice in the crime.

DARROW, CLARENCE S., an American lawyer, born in Kinsman, O., in 1857. He was educated in the public schools of Ohio and after studying law was admitted to the bar in 1875. He was for some time attorney of the Northwestern railroad, but was chiefly identified with cases against monopolies in which he took the part of the people against the trusts. He was chief counsel of the anthracite miners in the anthracite coal strike arbitration in 1902-1903. He was also counsel in the Debs strike case and in a large number of labor injunction and labor conspiracy cases, taking the side of labor. He served in the Illinois State Legislature in 1902. He won special prominence as counsel for the McNamara brothers in the Los Angeles "Times" dynamite case in 1911. He was counsel for Eugene V. Debs for conspiring to hinder the operation of the draft law in 1917. He was the author of a volume of essays and many pamphlets on social and economic questions.

DARTER. (1) an order in McGillivray's classification of birds, containing the kingfishers, bee-eaters, and jacamars, so called from their habit of darting onto their prey.

(2) A genus of web-footed swimming

birds belonging to the *Pelicanidæ*. The neck in all is exceedingly long. *Plotus melanogaster* is the snake-bird, so called from the serpent-like form of the neck and head. The darters are natives of tropical America and Africa, and of Australia.

DARTFORD, a thriving market-town of Kent, England; in the narrow valley of the Darent, 2 miles above its influx to the Thames, and 17 E. S. E. of London. Edward III. here founded an Augustinian nunnery (1355); St. Edmund's chantry was a great place of pilgrimage; and at Dartford Wat Tyler began his rebellion (1381). Pop., about 40,000.

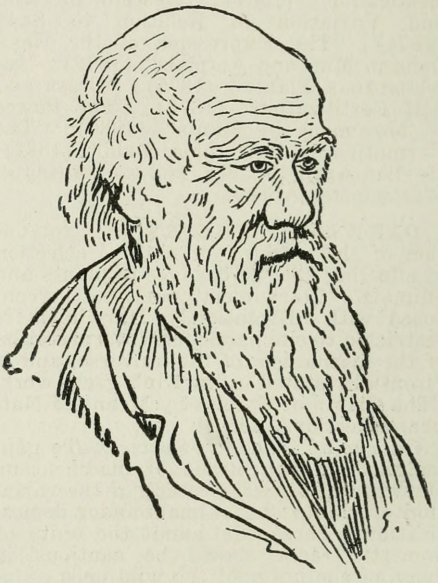
DARTMOUTH, a town of Massachusetts, in Bristol co. It is on the Paskamansett river. Its chief industries are poultry raising and dairying. There are also manufactures of box boards. There are three public libraries and other public buildings. The surrounding country is a well-known summer resort. Pop. (1910) 4,378; (1920) 6,493.

DARTMOUTH COLLEGE, an educational (non-sect.) institution in Hanover, N. H.; founded in 1769; reported at the end of 1919: Professors and instructors, 121; students, 1,673; volumes in the library, 150,000; productive funds, $4,500,000; income, $450,000; president, Ernest Mark Hopkins, Litt.D., LL.D.

DARU, PIERRE ANTOINE NOËL BRUNO, COMTE (dä-rü'), a French statesman, born in Montpellier, Jan. 12, 1767. At the age of 16 he entered the army, and at the breaking out of the Revolution adopted its principles. He attracted the notice of the First Consul, and, in 1802, became a member of the Tribunate. In 1805 he was made a councillor of state, and general intendant of the imperial household. He subsequently became the confidential friend of the emperor, and his prime minister. In 1812 he opposed the expedition to Russia. On the abdication of Napoleon, he retired from public life, and, although exiled by the first government of the restored Bourbons, was recalled in 1819, and made a peer of France. He afterward wrote a "Life of Sully" and a "History of Venice." He died Sept. 5, 1829.

D'ARUSMONT, MADAME FRANCES (dä-rüs-môn'), maiden name FANNY WRIGHT, an American philanthropist and author; born in Dundee, Scotland, Sept. 6, 1795. She visited this country several times, and in 1825 made an unsuccessful attempt to establish a settlement for the elevation of the negro at Memphis, Tenn. In later years she lectured on social, religious, and political questions. Among her works are: "Views on Society and Manners in America"; "Altorf," a tragedy (1819); "Lectures on Free Inquiry" (1836). She died in Cincinnati, O., Dec. 2, 1852.

DARWIN, CHARLES ROBERT, an English naturalist; born in Shrewsbury, Feb. 12, 1809; was the son of Dr. Robert Darwin and grandson of Dr. Erasmus Darwin. He was educated at Shrewsbury School, and at the universities of Edinburgh and Cambridge. He early devoted himself to the study of natural history, and in 1831 he was appointed natu-



CHARLES ROBERT DARWIN

ralist to the surveying voyage of H. M. S. "Beagle," commanded by Captain (afterward Admiral) Fitzroy. The vessel sailed in December, 1831, and did not return till October, 1836, after having circumnavigated the globe. In 1839 he married his cousin, Emma Wedgwood, and henceforth spent the life of a quiet country gentleman, engrossed in scientific pursuits.

In 1839 he published his "Journal of Researches During a Voyage Round the World"; in 1842, "Structure and Distribution of Coral Reefs"; in 1844, "Geological Observations on Volcanic Islands, Etc."; in 1846, "Geological Observations in South America"; in 1851 and 1854, his "Monograph of the Cirrhipedia," and soon after the "Fossil Lepadridæ and Balænidæ of Great Britain." In 1859 his name attained its great celebrity by the publication of "The Origin of Species by Means of Natural Selection." This work, scouted and derided though it was

at first, worked nothing less than a revolution in biological science. In it for the first time was given a full exposition of the theory of evolution as applied to plants and animals, the origin of species being explained on the hypothesis of natural selection.

The rest of his works are largely based on the material he had accumulated for the elaboration of this great theory. The principal are a treatise on the "Fertilization of Orchids" (1862); "Domesticated Animals and Cultivated Plants; or The Principle of Variation, etc., Under Domestication" (1867); "Descent of Man and Variation in Relation to Sex" (1871); "The Expression of the Emotions in Man and Animals" (1872); "Insectivorous Plants" (1875); "Cross and Self Fertilization" (1876); "The Power of Movement in Plants" (1880); "The Formation of Vegetable Mold" (1881). He died April 19, 1882, and was buried in Westminster Abbey.

DARWINIAN THEORY, the explanation of the working of natural selection in effecting specific changes in plants and animals. "Darwinism" must not be confused with "Evolution." Darwinism is restricted to one particular interpretation of the mechanism of the universe, and is essentially stated in Darwin's great work, "The Origin of Species by Means of Natural Selection."

Outline of Origin of Species.—To gain insight into the means of modification, Darwin begins with a study of the variation of plants and animals under domestication. Those who admit the unity of domestic races should be cautious in denying the unity of the wild ones. Domestic races all exhibit adaptations to man's use or fancy, rather than to their own good. The key to this is man's power of selection. Nature gives successive variations, man accumulates these, so making for himself useful breeds, and often (*e. g.*, in sheep, cattle, roses, dahlias) profoundly modifies their character even in a single human lifetime; so that in all characters to which he attends, they may differ more than the distinct species of the same genera. Unconscious selection, which results from everyone trying to possess and breed the best animals, is even more important than conscious selection. Two flocks of Leicester sheep kept equally pure appear of quite different varieties after 50 years. Such slowly accumulated change explains why we know so little of the origin of domestic races; and its absence in regions inhabited by uncivilized man explains why these yield no plants worth immediate culture. Human selection is facilitated (1) by the keeping of large numbers, since variations will be more frequent; and (2) by preventing free intercrossing. Some species vary more than others.

Variation Under Nature.—No two blades of grass are alike, and far more marked differences often occur, several strains or varieties sometimes existing in the same species. Between these strains, and much more frequently between forms which systematic botanists and zoölogists rank as true species, perfectly intermediate forms may occur. No agreement about the definition of species (the amount of difference necessary to give any two forms specific rank) has ever been reached. Individual differences are of the highest importance, as the first steps toward the slightest varieties worth recording; these in turn toward more distinct and permanent varieties; these varieties again toward sub-species, and in the next stage to species, though extinction may often arrest the process. The species which present most varieties are those which have the greatest geographical range, or the widest diffusion in their own territory, or which possess the greatest number of individuals.

Struggle for Existence.—All organic beings tend to increase with extreme rapidity, so that if they were not kept down, the earth would soon be covered by the progeny of a single pair. Since organisms are reproducing themselves so rapidly, and not all their offspring can escape their enemies, get food and live, much less leave progeny in turn, there must in every case be a struggle for existence, either of one individual with another of the same species, with the individuals of distinct species or with the physical conditions of life; often with all these at once, and that more or less intensely throughout the whole duration of life. The checks which prevent increase are more obscure, and vary in each case. In all cases the amount of food gives the limit. The youngest organisms generally suffer most. The struggle for life is most severe among individuals and varieties of the same species, and among the species of the same genus, since these tend to fill the same place in the economy of nature. The structure of every being is related to that of the others with which it competes, or from which it seeks to escape, or on which it preys.

Natural Selection.—The preservation of favorable variations, and the destruction of injurious ones, is termed by Darwin "Natural Selection," or less figuratively by Spencer, the "Survival of the Fittest." Human selection acts only for man's own good, on mere external and visible characters, and irregularly throughout a short period; natural selec-

tion acts for the good of the being itself, on the whole machinery of its whole life, and incessantly on the species, throughout almost infinite time. The circumstances favorable to the production of new forms are great variability; large numbers of individuals; the complex effects of intercrossing; isolation in small areas; also extension over continental ones, especially if these vary in altitude; and considerable lapse of time. Rare species are shown to be in process of extinction. The divergence of character in domestic breeds, largely due to the fact that "fanciers do not, and will not, admire a medium standard, but like extremes," applies throughout nature from the circumstance that the more diversified the descendants from any one species become in structure, constitution and habits, by so much will they be better enabled to seize on many and widely diversified places in nature, and so to increase in numbers. A carnivorous animal which has reached the maximum numbers its territory can support, can succeed in increasing only by its varying descendants seizing places hitherto occupied by other animals. This must hold equally of all species, and is separately demonstrated for plants.

Sexual Selection.—Not merely do individuals struggle for existence, but the males struggle for the females, and the most vigorous tend to leave most progeny. Several weapons, offensive and defensive, like the cock's spurs, the stag's horns, or the lion's mane, are used in this struggle, and the most useful variations are those which are transmitted.

Laws of Variation.—The same laws appear to have acted in producing the lesser differences between varieties of the same species and the greater differences between species of the same genus. Specific characters are more variable than generic, and varietal than either. Rudimentary organs and secondary sexual characters are variable. Zebra-like stripes on horses, or wood-pigeon's markings on fantails, tumblers, etc., may be explained as reversions toward their ancient progenitors.

Geological Succession of Organic Beings.—The most ancient forms differ widely from those now living, yet frequently present characters intermediate between groups now widely divergent, and resemble the embryos of the more recent and more highly specialized animals belonging to the same classes. Darwin's belief that the distinctness of birds from all other vertebrates was to be accounted for by the extinction of a long line of progenitors connecting them with reptiles, was in 1859 a mere assumption; but in 1862 the long-tailed and intensely reptilian bird Archæopteryx was discovered, while in 1875 the researches of Marsh brought to light certain cretaceous birds, and the hypothesis of Darwin is thus admirably verified.

Geographical Distribution. — Neither the similarity nor the dissimilarity of the inhabitants of various regions, whether of land or of sea, can be accounted for by identity or differences of climate, or other physical conditions; but both are related in the most striking degree to the absence or presence of barriers to migration between those regions.

Morphological Arguments.—The physiological and distributional lines of argument furnished by morphology are mainly four, and are derived from (a) Classification, (b) Homologies, (c) Embryology, (d) Rudimentary Organs. The great fact of classification is that organic beings, throughout all time, are arranged in groups subordinated under other groups, individuals under varieties, and these again under species; species under genera; genera under sub-families, families, and orders; and all under a few grand classes. The element of descent is already used in linking all the sexes, ages, forms, and varieties of the same species, widely though these may differ from each other in structure.

The members of the same class, independently of their habits of life, resemble one another in their general plan of organization. Thus the hand of man, the digging-paw of the mole, the leg of the horse, the paddle of the porpoise, and the wing of the bat, are all constructed on the same pattern, bone corresponding to bone.

Serial Homology is that unity of type which is found on comparing the different parts and organs in the same individual. The complex and varied jaws and legs of a lobster, or the different leaves, sepals, petals, stamens, and pistils of a flower, are all found to be modifications of a simple limb, and a simple leaf-organ respectively. The process of development goes from the general to the special; thus there is generally an advance in organization. In peculiar conditions degeneration may occur. All these facts are explained on the principle of successive slight variations not necessarily or generally supervening very early in life, and inherited at a corresponding period; hence it is in the highest degree probable that most embryonic stages show us more or less completely the progenitor of the groups in its adult state; and embryology thus rises greatly in interest.

DASKAM, JOSEPHINE DODGE (MRS. SELDEN BACON) an American

novelist, born in Stamford, Conn., in 1876, and graduated from Smith College in 1898. She first attained prominence by her novel "The Madness of Philip," published in 1902, in which she commented upon some aspects of primary education. Her works include: "The Biography of a Boy" (1910); "The Inheritance" (1912); "The Luck o' Lady Joan" (1913); "Today's Daughter" (1914), etc.

DASYPROCTA, a genus of mammals, the typical one of the family *Dasyproctidæ*, or in some classifications a genus of *Caviidæ*. It contains the agoutis.

DASYURE, the brush-tailed opossums, a genus of marsupial animals, sub-order *Sarcophaga*. They are natives of Australia. The name is derived from the tails being hairy, in which they differ from the opossums of America.

DATE, any given, fixed, or settled time; the time when any event happened; period; era; age; epoch; as, the date of the Christian Era, the date of a historical occurrence, etc. Also, that addition to a writing which specifies the year, month, and day when it was given or executed; the number which marks the time when any writing, instrument, coin, picture, etc., was executed. A deed may be good, though it mentions no date, or has a false date, or even if it has an impossible date, as the 30th of February, provided the real day of its being dated or given, that is delivered, can be proved. See CHRONOLOGY.

DATE PALM, a genus of palms, the most important species of which is the common date palm, the palm tree of Scripture (*Phœnix dactylifera*), a native of the N. half of Africa, the S. W. of Asia, and some parts of India. Some parts of China produce large crops. The stem, which is straight and simple, reaches a height of 30 to 60 feet, and bears a head of 40 to 80 glaucous pinnated leaves, of 8 to 10 feet long, and a number of branching spadices, each of which on the female tree bears 180 to 200 fruits. A bunch of dates weighs 20 or 25 pounds, so that an average year's crop may be reckoned at 300 to 600 pounds per tree. From the earliest times fertilization has been artificially aided by cutting off the male inflorescences just before the stamens ripen, and suspending them among those of the female tree; so avoiding the risks and losses of ordinary wind-fertilization. In a palm grove there may be but one male stem to 40 or 50 fruit-bearing ones.

This is one of the most important and useful of all the palms. In Egypt, and generally in north Africa, Persia, and Arabia, dates form the principal food, and date palms the principal wealth of the people. The fruit is eaten either fresh or dried, and in the latter state becomes an article of commerce. A sweet juice (date-honey) can be expressed from the fruits, from which a kind of wine is obtained by fermentation; also a sort of vinegar; an ardent spirit is of course also distilled from the fermented juice. Palm-wine is also made from the sap after the terminal bud is removed. The bud is eaten as palm-cabbage, similarly also the undeveloped panicles of flowers. The date "stones" or seeds are roasted in north Africa as a substitute for coffee, and have also been introduced into Great Britain for the same purpose. They are also ground and pressed for oil and the residue used for feeding cattle. From leaf-stalks of the common date palm, all kinds of basket and wicker work are also made, and walking-sticks, fans, etc. The leaves themselves are made into bags, mats, and other articles; the fibers of the web-like integuments at the base of their stalks into cordage. The wood is used for buildings, fences, etc.

Some derive the origin of the colonnade pillar in architecture to the regular mode of the planting of the palm tree and the use of its stem in building. The symbol of beauty and of victory alike to Hebrews and Hellenes from the earliest times, it passed readily to the suggestion of victory over death and glorious immortality; hence the habit of representing angels and the blessed with palms in their hands. It was largely used also for decoration of festivals, and for strewing in processions. Christ's triumphal entry into Jerusalem is still commemorated on Palm Sunday.

DATE PLUM, the name given to several species of *Diospyros*, a genus of trees of the ebony family. The European date plum is the *D. lotus*, a low-growing tree, native of the S. of Europe. It produces a small fruit, the supposed lotus of the ancients. The American date plum, or persimmon (*D. virginiana*), attains a height of 50 or 60 feet; the fruit is nearly round, about an inch in diameter, is very austere, but edible after being frosted. The Chinese date plum (*D. kaki*) is cultivated for the sake of its fruit, which is about the size of a small apple, and is made into a preserve.

DATHOLITE, a monoclinic mineral, of colors, varying from white to olive-green. It is of a vitreous luster, and translucent. Specific gravity, 2.8-3; hardness, 5-5.5. It is found in various localities in North America, Scotland, Sweden, etc. Composition: Silica, 36.08-

38.51; boric acid, 19.34-22.40; lime, 34.68-35-67; water, 4.60-8.63.

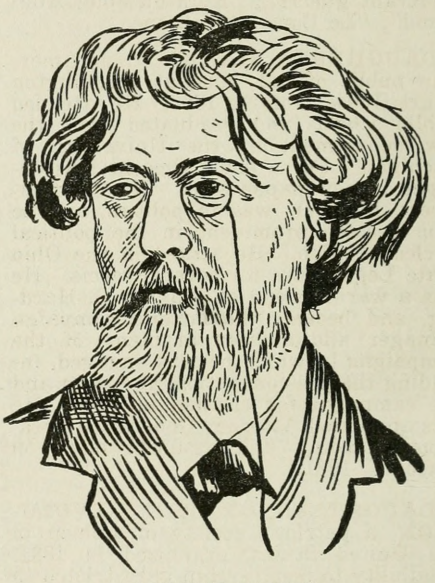
DATISCACEÆ, datiscads, an order of diclinous exogens, alliance *Cucurbitales*. The species are either branched herbs or trees of some size. Lindley enumerated three genera, and estimated the known species at four. They are scattered over North America, Asia, and the S. E. of Europe.

DATURA (da-tu'rä), a genus of *solanaceæ*, tribe *Datureæ*. The calyx and corolla are infundibulate, the latter much the larger of the two, both five-lobed; capsule four-celled. *D. stramonium* is the thorn apple, better known in this country as the Jamestown weed, the name arising from a poisoning among the Virginian settlers by its use. It is found on dung-hills, in waste places, etc. When taken internally it is a powerful narcotic; medically it is used in mania, convulsions, epilepsy, ticdoloureux, etc. When smoked it palliates the symptoms in asthma. *D. tatula* and *metel* are similarly used. The seeds of these two latter species are said to have been used to produce the frenzied ravings of the priests in the Delphic and some other temples. The Peruvians use for the same purpose *D. sanguinea*, and they also manufacture from it an intoxicating beverage.

D'AUBIGNÉ (dō-bēn-yä) **THÉODORE AGRIPPA**, a French scholar; born near Pons, in Saintonge, Feb. 8, 1552, of a noble family, he early entered the military profession, and distinguished himself by his services to the Huguenot cause. He was subsequently rewarded by Henry IV., who made him Vice-Admiral of Guienne and Brittany. His severe and inflexible character frequently embroiled him with the court; and after Henry's assassination (1610), he betook himself to Geneva, where he spent the remainder of his life in literary studies. His best known work is a "Universal History." He died April 29, 1630.

DAUBIGNY, CHARLES FRANÇOIS (dō-bēn-yē'), a French landscape painter and etcher; born in Paris, in 1817; studied under his father, who was a miniature painter, Paul Delaroche, and others; and from 1838 exhibited in the Salon, though his full recognition only came after he was 50. He devoted himself to close and sympathetic study from nature, working much on the Seine in a houseboat. In 1853 he gained a first-class medal with his "Pool of Gylien." In 1857 he produced his "Springtime"; in 1861, "The Banks of the Oise"; in 1872; "Windmills at Dordrecht"; and in 1877, "Rising Moon." His "Sluices in the Valley of Optevos" (1855) and his "Vintage" (1863) are in the Luxembourg Gallery. He is also known as a book-illustrator and as a vigorous etcher. He died in Paris, Feb. 19, 1878.

DAUDET, ALPHONSE (dō-dā'), a French novelist; born in Nîmes, May 13, 1840. He sought fortune in Paris in 1857; two booklets of poems were failures; two plays—"The Last Idol" (1862) and "The White Daisy" (1865)—had more success. His charming little stories, "The Little Thing" (1868); "Letters from My Mill" (1869); "Monday Tales" (1873), established his reputation; and his next novel—"Fromont Jr. and Risler Sr." (1874)—was translated into all the European languages. Not less celebrated are: "The Nabob" (1878); "Kings in Exile" (1880); "Numa Roumestan" (1882); "Sappho" (1884). He struck a humorous vein in the "Tartarin" series: "Prodigious Adventures of Tartarin"; "Tartarin in the Alps"; "Port Tarascon." He wrote two volumes of reminiscences. "Thirty Years of Paris" (1888), and "Recollections of a Man of Letters" (1889). He died in Paris, Dec. 16, 1897.



ALPHONSE DAUDET

DAUDET, ERNEST, a French novelist; brother of Alphonse Daudet; born in Nîmes, May 31, 1837. His most notable novels are: "The Venus of Gordes"; "The Bloom of Sin"; "Martha." He is author of an autobiographical sketch, "My Brother and Myself" (1882); and

has written some historical sketches, as a "History of the Royalist Conspiracies in the South During the Revolution"; "History of the Emigration." "The Tragedies and Comedies of History" (1912).

DAUDET, LÉON, a French author, born in 1867 and was educated at the Lycée Louis le Grand. He studied medicine for ten years, and in 1894 took up literature, since writing many novels and articles, these last chiefly in the "Figaro," "Gaulois," "Soleil" "Le Libre Parole." In 1908 he founded with some friends the royalist journal, *"l'Action Française."* He is a member of the Académie Goncourt. His works include: "Hœrès"; "Les Idées en marche"; "Le Voyage de Shakspeare"; "Suzanne"; "L'Avant guerre"; "Hors du Joug Allemand"; "Le Cœur et l'absence."

DAUGHERTY, HARRY M., an American public official, born at Washington Court House, Ohio, in 1860. He attended public schools and graduated from the law department of the University of Michigan. For a short time he was engaged in newspaper work. His chief interest, however, was in politics, and he soon became prominent in the political circles of Ohio. He served in the Ohio State Legislature for several terms. He was a warm friend of Warren G. Harding, and became the latter's campaign manager and adviser in many of the campaigns in which he was engaged, including the pre-convention campaign and the campaign for election in 1920. He was appointed Attorney General by President Harding and assumed office on March 4, 1921.

DAUGHTERS OF THE REVOLUTION, a patriotic society of women in the United States, organized in 1891. Eligibility to membership is restricted to "women who are lineal descendants of an ancestor who was a military or naval or marine officer, soldier, sailor, or marine, in actual service under the authority of any of the 13 Colonies or States, or of the Continental Congress, and remained always loyal to such authority, or descendants of one who signed the Declaration of Independence, or of one who as a member of the Continental Congress or of the Congress of any of the Colonies or States, or as an official appointed by or under the authority of any such representative bodies, actually assisted in the establishment of American independence by service rendered during the War of the Revolution, becoming thereby liable to conviction of treason against the government of Great Britain, but remaining always loyal to the authority of the Colonies or States." There are numerous subordinate State organizations.

DAVENANT, WILLIAM, an English poet and playwright; born at Oxford in February, 1606. A story was current in his lifetime that he was an illegitimate son of Shakespeare. He wrote many plays and poems, but none possessing any distinguished merit; he succeeded Ben Jonson as poet-laureate of England, however. He attempted epic composition in "Gondibert" and an opera, "The Siege of Rhodes." He died April 7, 1668.

DAVENPORT, a city and county-seat of Scott co., Ia.; on the Mississippi river and the Rock Island, the Chicago, Milwaukee and St. Paul, the Burlington and Northern, the Davenport, Rock Island and Northwestern, and other railroads, and the Hennepin canal; 183 miles S. W. of Chicago. It is connected with Rock Island, Ill., by a railroad and carriage bridge built by the United States Government at a cost of $1,200,000. Davenport is the great grain depot of the upper Mississippi. Area, 8 square miles.

Davenport is an important manufacturing center, and is situated in the heart of extensive bituminous coal fields. The chief articles of manufacture are carpets, locomotives, steel cars, carriages, agricultural implements, flour, lumber, cigars and cigarettes, and foundry and machine shop products. The Government arsenal at Rock Island is opposite the city. The city is connected by passenger and freight steamers with all important lake ports. In 1919 there were 2 National banks.

The city is built at the foot of a semicircular range of hills, is well laid out, and is handsome architecturally. The streets are lighted by gas and electricity and the principal ones are traversed by electric cars. The notable buildings include the county buildings, City Hall, Iowa Orphans' Home, the Academy of Natural Science, Mercy and St. Luke's Hospitals, and the Iowa Soldiers' Orphans', Old Ladies', and Old Men's Homes. The city has an excellent school system, the immaculate Conception Academy, St. Ambrose Academy, Griswold College, and St. Katherine's Hall.

History.—Davenport was founded in 1835 and incorporated as a city in 1851. Pop. (1910) 43,028; (1920) 56,727.

DAVENPORT, EDWARD LOOMIS, an American actor; born in Boston, Mass., in 1816. He made his first appearance at the Lion Theater, Providence, R. I., when 22 years old. After a season at the Bowery Theater, New York, he appeared at the Walnut Street

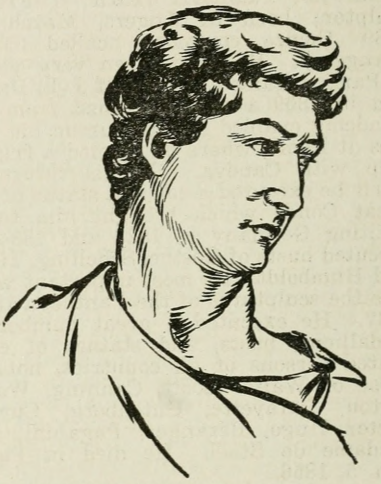
Theater, Philadelphia, in 1838, and then confined himself to Boston till 1847, when he accompanied Mrs. Mowatt to England and played "Claude Melnotte" to her "Pauline" in the large cities, and supported Macready two seasons. In 1854 he returned to the United States; in 1859 became manager of the Howard Athenæum, Boston; and in 1869 of the Chestnut Street Theater, Philadelphia. He died in Canton, Pa., Sept. 1, 1877.

DAVENPORT, FANNY LILY GYPSY, an American actress; born in London, April 10, 1850. Her first appearance on the stage was at the Howard Athenæum in Boston, then under the management of her father, E. L. Davenport. She played during her career in the theaters of all the large cities in the United States. Her most noted rôles were in "La Tosca," "Giaconda," "Fedora," and "Cleopatra." She was married in 1879 to Edwin H. Price, but was divorced and subsequently married Melbourne McDowell, an actor of leading rôles in her company. She died near Duxbury, Mass., Sept. 26, 1898.

DAVENPORT, HOMER CALVIN, an American cartoonist; born in Silverton, Ore., March 8, 1867. He was bred on a farm in Oregon, having neither common school nor art education. After serving as a jockey, a fireman and a circus clown, he became a cartoonist for the San Francisco "Examiner" in 1892. In 1896 he began drawing cartoons for the New York "Journal," and since 1900 for the Chicago "American" as well. In 1906 Mr. Davenport visited Arabia and drew a portrait of the Sultan of Turkey. He wrote "Belle of Silverton" (1900) and "The Diary of a Country Boy" (1910). He died on March 2, 1912.

DAVID, the capital of Chiriqui, in Panama, in a fertile plain on the Rio David, which enters the Pacific 8 miles to the S. Stock-raising and the cultivation of tobacco are extensively engaged in, and there is a considerable trade. Pop. 9,000.

DAVID, King and Prophet of Israel; born in Bethlehem, 1085 B. C.; was the eighth youngest son of Jesse of Bethlehem. He was keeping his father's flocks when he was selected and anointed by the prophet Samuel, at the age of 15, to succeed Saul. Brought to the court of Saul to soothe the melancholy of the king by his harp, he first signalized himself by slaying Goliath of Gath, a gigantic Philistine. He won the friendship of Jonathan, and the love of his daughter Michal, but drew upon himself the jealousy, and finally the fury of the unhappy king, who repeatedly attempted to kill him. David fled into the wilderness. At the head of a band of outlaws and malcontents he baffled every attempt of Saul to capture him. When Saul fell, David was acknowledged king by the tribe of Judah; but the other tribes, at the instigation of Abner, placed Ishbosheth, the younger son of Saul, on the throne, thus occasioning a civil war. On the death of Ishbosheth, however, the contending parties submitted to David, who reigned for 30 years. He took Jerusalem from the Jebusites, and gained considerable victories over the Philistines and other neighboring nations; but tarnished his glory by taking Bathsheba from Uriah, her husband, and putting him to death. A rebellion was excited against him by his son Absalom, which was quelled, and Absalom slain. At the close of his life, he abdicated in favor of his son Solomon. He died 1015 B. C. A considerable portion of the Book of Psalms was composed by him.



DAVID, KING OF ISRAEL

DAVID I. (often called St. David), King of Scotland; born in 1084; succeeded his brother, Alexander the Fierce, in 1124. He married Maud, grandniece of William the Conqueror; and was earl of Northumberland and Huntingdon when called to the Scottish throne. On the death of Henry I., King of England, he maintained the claim of his daughter Maud against King Stephen and seized Carlisle, but was defeated at the battle of Northallerton in 1138. He died in 1153.

DAVID II., King of Scotland, son of Robert Bruce; born in 1324; succeeded to the throne in 1329. On the death of his father he was acknowledged by the

great part of the nation. Edward Baliol, however, the son of John Baliol, formed a party for the purpose of supporting his pretensions to the crown; he was backed by Edward III. of England. Battles were frequent, and at first Baliol was successful; but eventually David succeeded in driving him from Scotland. The war was carried on with England with increasing rancor, till David was made prisoner at the battle of Neville's Cross (1346). After 11 years of captivity he was ransomed for 100,000 marks. He died in 1370.

DAVID, PIERRE JEAN, a French sculptor; born in Angers, March 12, 1789 (hence commonly called David d'Angers). He went when very young to Paris, became the pupil of J. L. David, and in 1809 a prize obtained from the Academy enabled him to pursue his studies at Rome, where he formed a friendship with Canova. On his return to Paris he executed a colossal statue of the great Condé which brought him fame. Visiting Germany in 1828 and 1834 he executed busts of Goethe, Schelling, Tieck, and Humboldt. His most important work was the sculptures of the Pantheon 1831-1837. He executed a great number of medallions, busts, and statues of celebrated persons of all countries, notably those of Walter Scott, Canning, Washington, Lafayette, Gutenberg, Cuvier, Victor Hugo, Béranger, Paganini, and Madame de Staël. He died in Paris, Jan. 5, 1856.

DAVID COMNENUS (kom-nē'nus), the last Emperor of Trebizond, usurped the throne upon the death of his brother John. In 1458 he ceded his empire to Mohammed II., on condition that the latter should marry his daughter. This condition the Sultan observed, but caused David to be put to death, with seven of his sons, 1462.

DAVIDS, THOMAS WILLIAM RHYS, an English publicist, lawyer, and scholar; born in Colchester, May 12, 1843. He was educated at the University of Breslau; from 1866 on, filled judicial places in Ceylon and acted as Archæological Commissioner. In 1877 he was called to the London bar, and subsequently became Professor of Pali and Buddhist Literature in University College, London. Among his works are: "Buddhism" (1878); translations of "Buddhist Birth Stories" (1880); "Buddhist Suttas" and "Vinaya Texts" (1881); published in "The Sacred Books of the East"; "Buddhist India" (1912); "Early Buddhism" (1908).

DAVIDSON, GEORGE, an American astronomer; born in Nottingham, England, May 9, 1825; came to the United States in 1832; graduated at the Central High School, Philadelphia, in 1845; and joined the United States Coast Survey. While in this service he was chief engineer of a party which surveyed a ship-canal route across the Isthmus of Darien. He also made a geographical survey of the coast of Alaska in 1867. In 1874 he had charge of the party which went from the United States to Japan to make observations on the transit of Venus. He traveled extensively in Egypt, China, India, and Europe, for purposes of scientific study. From 1877-1884 he was Regent of the University of California, and for many years was President of the California Academy of Sciences. He retired from the Coast Survey, after 50 years of distinguished service, in 1895, and became Professor of Geography in the University of California. He is the author of numerous works on irrigation, harbor and river improvements, "Francis Drake" (1908), etc. He died in 1911.

DAVIDSON, RANDALL THOMAS, Archbishop of Canterbury. He was born in 1848, and was educated at Harrow and Trinity College, Oxford. He was curate of Dartford, Kent, 1874-1877; chaplain and private secretary to Archbishop Tait of Canterbury, 1877-1882; to Archbishop Berson, 1882-1883; examining chaplain to Bishop Lightfoot of Durham, 1881-1883; sub-almoner to Queen Victoria, 1882; one of the six preachers of Canterbury Cathedral, 1880-1883; Dean of Windsor and domestic chaplain to Queen Victoria 1883-1891; Clerk of the Closet to Queen Victoria, 1891-1901, and to King Edward, 1901-1903. In 1891 he became bishop of Rochester and continued in that position till 1895. He was bishop of Winchester, 1895-1903. In this last year he became archbishop of Canterbury. He has been trustee of the British Museum from 1884 and was prelate of the Order of the Garter, 1895-1903. He was created G. C. V. O. 1904, and received Royal Victorian Chain, 1911. In 1918 he received the Grand Cross of the Royal Order of the Saviour (Greece); and in 1919 the Grand Cordon de l'ordre de la Couronne (Belgium); also the First Class of the Order of St. Sava (Serbia).

DAVIDSON COLLEGE, an educational institution in Davidson, N. C.; founded in 1837, under the auspices of the Presbyterian Church; reported at the end of 1919: Professors and instructors, 16; students, 379; president, Wm. J. Martin, LL.D.

DAVIES, ARTHUR B., an American painter, born in Utica, N. Y., in 1862.

He began his work as an illustrator of magazines. He first achieved fame as a painter at an exhibition held in New York in 1899. His best paintings are found in the Brooklyn Museum. Among these is the "Children of Yesteryear," considered by many to be his best work. Among his other masterpieces are "The Girdle of Ares," (1914); "Visions of the Sea" (1911); "The Hunter of the Star Lands". His recent paintings show a decided cubist tendency.

DAVIES, SIR LOUIS HENRY, a Canadian lawyer. He was born on Prince Edward Island, Canada, 1845; and was educated at Prince of Wales College. He became a barrister in 1867; Solicitor-General, 1869 and 1871-1872; Leader of the Opposition, 1873-1876; Premier and Attorney-General, Prince Edward Island, 1876-1879; and Q. C., 1880. In 1882 he was elected to the Dominion House of Commons, and was re-elected until his appointment to Appeal Court. He was counsel for Great Britain before the International Fisheries Arbitration at Halifax in 1877 between Great Britain and the United States. He became P. C., Canada, in 1896; Joint Delegate to Washington with Sir Wilfrid Laurier, 1897, on Behring Sea seal question; one of Joint High Commissioners in 1898 for settlement of differences between United States and Canada; Minister of Marine and Fisheries, Canada, 1896-1901. From 1918 he was Chief Justice of the Supreme Court of Canada (Appeal).

DAVIES, RANDALL, an English author, born in 1866, and educated at Bradfield (Founder's Boy) and Scoones'. He was for a time Art Critic to the "Academy", "Westminster Gazette", "New Statesman," and "Queen," and also reviewed for the "Burlington," "Athenæum," "Saturday Review" and other periodicals. He qualified as a Solicitor in 1898, and later came to the United States where he was for some years Confidential Secretary to Joseph Pulitzer, of the New York "World." His works include: "Chelsea Old Church"; "Portfolio Monograph"; "Six Centuries of Painting"; "Stories of the English Artists"; "The Greatest House at Chelsea"; "A Lyttel Booke of Nonsense"; "Monographs on Velasquez, Reynolds, and Romney."

DA VINCI, See LEONARDO DA VINCI.

DAVIS, CHARLES HENRY, an American mathematician; born in Boston, Jan. 16, 1807. He entered the United States navy in 1823, and was commissioned commander in 1854. He made several coast-surveys, partly in conjunction with Prof. A. D. Bache, and partly with others. He wrote "Memoir upon the Geological Action of the Tidal and other Currents of the Ocean," and "The Law of Deposit of the Flood Tide." He was also one of the founders of the "American Nautical Almanac." He died in Washington, D. C., Feb. 18, 1877.

DAVIS, CHARLES HENRY, an American rear-admiral, born in Cambridge, Mass., in 1845. He graduated from the United States Naval Academy in 1864 and became an ensign in 1866. He rose through the grades, becoming commander in 1885; captain in 1898; and rear-admiral in 1904. He served on various stations and duties and was connected with several expeditions for the determination of the difference of longitude by means of submarine telegraph cables. In 1897-1898 he was superintendent of the Naval Observatory. He served during the Spanish-American War as commander of the auxiliary cruiser, "Dixie." In 1904-1905 he served as a member of the International Commission of Inquiry on the North Sea incident. He was retired by the operation of law on Aug. 28, 1907. He was the author of several books on the determination of longitude. He wrote "Life of Rear-Admiral Davis" (1899).

DAVIS, CUSHMAN KELLOGG, an American legislator; born in Henderson, N. Y., June 16, 1838. He was graduated at the University of Michigan in 1857; was admitted to the bar, but enlisted in the Union army in 1861. He began the practice of law in St. Paul in 1865; was chosen to the Minnesota Legislature in 1867; became United States district attorney in 1868; governor in 1874; and United States Senator in 1887, 1893 and 1899. He was a Republican, and a member of the Peace Commission, which negotiated the treaty between Spain and the United States in 1898. He was for several years chairman of the Senate Committee on Foreign Relations, and reported the resolution which practically declared war against Spain. He died at St. Paul, Minn., Nov. 27, 1900.

DAVIS, DAVID, an American jurist; born in Cecil co., Md., March 9, 1815. He was graduated at Kenyon College in 1832, and settled in Illinois as a lawyer in 1835. He was elected to the Legislature in 1844 and served as a State Circuit Judge from 1848 to 1862. In the latter year he was appointed an Associate Justice of the Supreme Court of the United States. He voted in favor of the Legal Tender act. He resigned in 1877 to enter the United States Senate, of which he became president

pro tem, in 1881, and retired in 1883. He died in Bloomington, Ill., June 26, 1886.

DAVIS, JAMES J., an American public official, born in Pittsburgh, in 1876. He attended public school, but when still a youth, went to Elwood, Ind., where he worked in a tin-plate mill. Two years later he was elected city clerk of Elwood, and later became county recorder. After some time spent in gold mining in the West, he undertook to reorganization of the Loyal Order of Moose. He was so successful in this endeavor that he was elected supreme dictator and reorganizer. Through his efforts about 1,500,000 men were brought into the organization. He engaged also in the manufacture of jewelry and other lines of business, and was actively identified with union labor. He founded the Orphan's Home of Moose at Mooseheart, Ill. He engaged in the banking business in Pittsburgh. Mr. Davis was appointed Secretary of Labor by President Harding and assumed office on March 4, 1921.

DAVIS, JEFFERSON, an American statesman; born in Abbeville, Christian co., Ky., June 3, 1808. When he was three years old, his father removed with his family to Wilkinson co., Miss. He received an academical education and entered Transylvania University, Lexington, Ky., in 1822, which he left in 1824 to enter the United States Military Academy from which he was graduated in 1828. He was appointed a second lieutenant of infantry, and served on the Northwestern frontier during the Black Hawk War of 1831-1832. In 1831 he was promoted to first lieutenant of dragoons for gallantry in action, and was employed in operations against the Pawnees, Comanches, and other Indian tribes. In June, 1835, he resigned his commission, and retired to a cotton plantation in Mississippi. In 1843 he began to take an interest in politics upon the Democratic side; and in 1844 was chosen a presidential elector. In 1845 he was elected a Representative to Congress; but resigned in 1846, having been elected colonel of the First Mississippi Volunteer Regiment of rifles, and served in the Mexican War, greatly distinguishing himself at Monterey and Buena Vista, and being severely wounded in the latter battle. He was appointed a Brigadier-General of volunteers by President Polk in 1847, but declined the commission on the grounds that, by the Constitution, the militia appointments were reserved to the States, and that such appointments by the President were in violation of State rights.

The same year he was chosen to fill a vacancy in the United States Senate, and was re-elected by acclamation in 1850 for a full term. In 1853 he was appointed Secretary of War by President Pierce, and in 1857 was again elected to the United States Senate, when he took a prominent place among the Southern leaders, and was among the most determined of them all in his assertions of the rights of the States under the Constitu-



JEFFERSON DAVIS

tion, and also of the right of secession. On Jan. 21, 1861, he took his leave of the Senate in a speech in which he gave his opinion that, by the secession of his State, his connection with that body was terminated, and reaffirmed the doctrine of the right of secession. The Confederate Congress, at Montgomery, Ala., chose him President, under the Provisional Constitution, on Feb. 9, 1861, and he accepted the office on the 16th.

On April 17, two days after the first proclamation of President Lincoln, he responded by a proclamation authorizing privateering; and on Aug. 14 issued a second one, warning all persons of 14 years and upward, owing allegiance to the United States, to leave the Confederacy within 40 days, or be treated as alien enemies. On Nov. 6 he was chosen permanent President, and was in-

augurated Feb. 22, 1862. Mr. Davis continued to be President of the Southern Confederacy until his capture at Irwinsville, Ga., May 10, 1865, having left Richmond a few hours before General Lee withdrew his troops, and after General Lee's surrender, when he was endeavoring to reach the Army of the West. He was conveyed to Fort Monroe, and indicted by the Grand Jury of the District of Columbia for treason. He was never brought to trial; never asked pardon, and only asked a trial; but, after two years' imprisonment, was released, at the instance of the Government, on bail, Horace Greeley becoming one of his sureties. He was included in the General Amnesty Act of Congress (Dec. 25, 1868). The last years of his life were spent at Beauvoir, Miss. He died in New Orleans, La., Dec. 6, 1889, and in 1893, amid imposing ceremonies, his remains were removed to Richmond, Va., and reinterred in Hollywood Cemetery. He wrote a narrative of the events of 1861-1865. "The Rise and Fall of the Confederate Government" (1881).

DAVIS, JOHN WILLIAM, an American lawyer and public official, born in Clarksburg, W. Va., in 1873. He graduated from Washington and Lee University in 1892 and afterward took a course in law at that institution. He was admitted to the bar in 1895 and in the following year served as assistant professor of law in Washington and Lee University. From 1897 he was engaged in the practice of law as a member of the law firm of Davis & Davis at Clarksburg, W. Va. He was a member of the State House of Delegates in 1899 and served as delegate to the Democratic National Convention in 1904. In 1911 he was elected to the 62d Congress and was re-elected on the expiration of his term to the 63d Congress. He resigned in 1913 to accept the post of solicitor-general of the United States. He served until November, 1918, when he was appointed ambassador to Great Britain by President Wilson. He was a member of the American delegation for conferring with the Germans on the treatment and exchange of prisoners of war, in 1918. Mr. Davis was prominently mentioned as a candidate of the Democratic nomination for president in 1920.

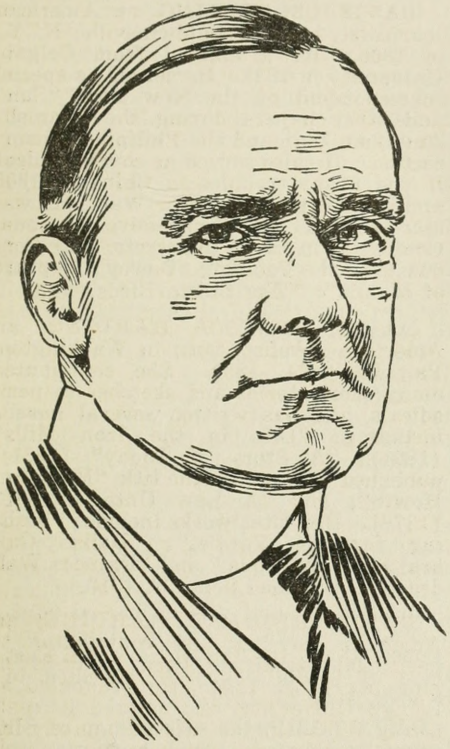
DAVIS, KATHERINE BEMENT, an American public official. She was born in Buffalo in 1860, and graduated from Vassar College in 1892 and later received the degree of Ph.D., from the University of Chicago. From 1892-1897 she was in Philadelphia in charge of the college settlement work. In 1901 she became superintendent of the Bedford Reformatory for girls, a position which she retained for 12 years. During her work as a penologist she applied scientific laboratory work in endeavoring to arrive at a right method in reforming delinquent girls and women. In 1914 Mayor Mitchel appointed her Commissioner of Correction, she being the first woman commissioner ever appointed in New York City. She resigned in 1915 and was appointed chairman of the Parole Board of New York City, 1918.

DAVIS, OSCAR KING, an American journalist, born in Baldwinsville, N. Y., in 1866. He graduated from Colgate University in 1888. He served as special correspondent on the New York "Sun" and other papers during the Spanish-American War and the Philippine Insurrection. He also served as correspondent in the Boxer troubles in China in 1900 and in the Russo-Japanese War. He was secretary of the Progressive National Committee in 1912. He wrote "Our Conquests in the Pacific"; "Dewey's Capture of Manila"; "The Storm Birds," etc.

DAVIS, REBECCA HARDING, an American novelist; born in Washington, Pa., June 24, 1831. She contributed many short stories and sketches to periodicals, and has written several novels, including: "Life in the Iron Mills" (1861); "A Story of Today" (1861), published later under the title "Margaret Howth"; and "A Law Unto Herself" (1878). Her later works include: "Waiting for the Verdict"; "Dallas Galbraith"; "Natasqua," and "Frances Waldeaux." She died Sept. 29, 1910.

DAVIS, RICHARD HARDING, an American novelist and contributor to periodical literature; born in Philadelphia, April 18, 1864. He graduated at Lehigh University, and entered journalism in Philadelphia. His first purely literary success was the story of "Gallegher," based upon his newspaper experiences, and published with other stories in a volume (1891). Among his works are: "Stories for Boys" (1891); "Van Bibber and Others" (1892); "The Rulers of the Mediterranean" (1894); "The Princess Aline" (1895); "About Paris" (1895); "Three Gringoes in Venezuela and Central America" (1896); "Soldiers of Fortune" (1897); "The Lost Road" (1913), etc. In 1898 he was a war correspondent in Cuba and in 1900 he acted in the same capacity in South Africa and in the World War. He wrote a number of successful plays, among them "The Galloper," "The Yankee Tourist," and "Vera, the Medium." He served as war correspondent during the first years of the World War. He died in 1916.

DAVIS, VARINA ANNE JEFFERSON, "the Daughter of the Confederacy"; born in Richmond, Va., June 27, 1864. Her father was Jefferson Davis, the President of the Confederate States, and she was born in the Executive Mansion. Her education was obtained partly in the United States and partly in Germany and France, and she wrote "The Veiled Doctor," a novel, and numerous essays and tales. She died at Narragansett Pier, R. I., Sept 18, 1898.



RICHARD HARDING DAVIS

DAVIS, WILLIAM MORRIS, an American geographer and geologist, born in Philadelphia in 1850. He graduated from the Lawrence Scientific School in 1869 and took post-graduate studies in several foreign universities. He was assistant in the Argentine National Observatory from 1870 to 1873. In 1878 he became instructor of physical geography at Harvard University and was successively assistant professor and professor of this subject. In 1899 he was appointed Sturgis-Hooper professor of geology and continued to occupy this chair until 1912, when he became professor emeritus. He took part in many important geographical expeditions in Africa, Asia, and Australia. He was an honorary member of many foreign geographical societies. His works include "Physical Geography" (1898); "Geographical Essays" (1909); and numerous scientific essays. He was associate editor of the "American Journal of Science."

DAVIS, WILLIAM STEARNS, an American author and university professor, born at Amherst, Mass., in 1877. He graduated from Harvard in 1900 and took his doctor's degree in 1905. In 1907 he became associate professor of mediæval and modern history at Oberlin College, and in 1909 professor of history at the University of Minnesota. His writings include historical works and also some historical romances. Most important of these are: "A Victor of Salamis" (1907); "The Influence of Wealth in Imperial Rome" (1910); "The Friar of Wittenberg" (1912); "A History of Mediæval and Modern Europe" (1914).

DAVISON, HENRY POMEROY, an American financier, born in Troy, Pa., in 1867, and educated privately at South Williamstown, Mass. In 1891 he became teller of the Astor Place National Bank in New York City and rose gradually in the financial world until in 1899 he became president of the Liberty National Bank of New York. A year or two later he became Vice-President of the First National Bank. Later he entered the firm of J. P. Morgan & Co. and became an active partner in that concern. In 1917 he was appointed chairman of the war council of the American Red Cross and during the World War he largely directed the huge undertakings of this society. After the close of the war he devoted himself to reconstruction problems in Europe.

DAVIS STRAIT, a strait that washes the W. coast of Greenland, and connects Baffin Bay with the Atlantic Ocean. At its narrowest point, immediately N. of the Arctic circle, it measures about 200 miles across. In 1888 the identity between Ginnunga Gap, referred to in the Sagas, and the present Davis Strait was demonstrated.

DAVIT. 1. A beam projecting from a ship's bow, for the attachment of the tackle whereby the anchor-fluke is lifted without dragging against the side of the vessel. The operation is nautically called fishing the anchor.

2. One of a pair of cranes on the gunwale of a ship, from which are suspended the quarter or other boats. The boat-tackles are attached to rings in the bow and stern of the boat respectively, and the fall is belayed on deck. When the boat is lowered the hooks of the fall-blocks are cast off simultaneously, or

great danger results when the ship is under way.

DAVITT, MICHAEL, founder of the Irish Land League; born near Straid, County Mayo, in 1846. Evicted from their small holding, the family emigrated to Haslingden in Lancashire (1851); and here six years later the boy lost his right arm in a cotton machine. In 1866 he joined the Fenian movement, the result being that he was sentenced in 1870 to 15 years' penal servitude. He was released in 1877; and began some two years later an anti-landlord crusade in Ireland, which culminated in the foundation of the Irish Land League (Oct. 21, 1879). Davitt was thenceforward in frequent collision with the government, and from February, 1881, to May, 1882, was imprisoned in Portland for breaking his ticket-of-leave. His "Leaves from a Prison Diary" were published in 1885. Though a strong Home Ruler, on the question of land nationalization he found himself in opposition to the Parnellites. He opposed the continued leadership of Mr. Parnell, and was returned to Parliament in 1892 as an anti-Parnellite, but unseated on petition. He was returned unopposed for South Mayo in 1895. He died May 31, 1906.

DAVOS (dä'vōs), a small valley lying among the Alps of the eastern Grisons, 16 miles S. E. of Coire. The village of Davos-Platz stands 5,105 feet above sea-level; but the valley, inclosed by lofty hills, has become famous as a health-resort in winter, especially for such as suffer from chest disease. The inhabitants of the valley, which till 1848 was one of the 26 independent republics of the Grisons, are mostly German Protestants.

DAVOUT, LOUIS NICOLAS (dä-vō'), a marshal of France; born in Annoux, May 10, 1770. He studied with Napoleon at Brienne, and entered the army in 1785. He took sides with the revolutionists, fought several battles under Dumouriez, and was made a Brigadier-General in 1793. He accompanied Napoleon in his Italian campaigns and in his expedition to Egypt. In 1804 he was made a marshal of the empire. The victories of Ulm and Austerlitz were mainly due to him, as also those of Eckmühl and Wagram. For these meritorious services he was created Duke of Auerstädt and Prince of Eckmühl. He joined the Russian expedition, and was wounded at Borodino. After the retreat from Moscow he defended Hamburg against all the forces of the allies, and surrendered only after the peace of 1814. When Napoleon returned from Elba, Davout was appointed his minister of war. After the battle of Waterloo he lived in retirement until 1819, when he took his seat in the Chamber of Peers. He died in Paris, June 1, 1823.

DAVY, SIR HUMPHRY, BART., an English chemist; born in Penzance, Dec. 17, 1778. After having received the rudiments of a classical education he was placed with a surgeon and apothecary, and early developed a taste for scientific experiments. He was appointed Professor of Chemistry in the Royal Institution at the age of 24. In 1803 he was chosen a member of the Royal Society. His discoveries with the galvanic battery, his decomposition of the earths and alkalies and ascertaining their metallic bases, his demonstration of the simple nature of the oxy-muriatic acid (to which he gave the name of chlorine), etc., obtained him an extensive reputation; and in 1810 he received the prize of the French Institute. In 1814 he was elected a corresponding member of that body. Having been elected Professor of Chemistry to the Board of Agriculture he delivered lectures on agricultural chemistry during 10 successive years.

The numerous accidents arising from fire-damp in mines led him to invent his safety-lamp. He was knighted in 1812 and created a baronet in 1818. In 1820 he succeeded Sir J. Banks as president of the Royal Society. His most important works are: "Philosophical Researches," "Elements of Agricultural Chemistry," "Electro-Chemical Researches," "Elements of Chemical Philosophy." He also contributed some valuable papers to the "Philosophical Transactions," and was author of "Salmonia, or Days of Fly-fishing," and "Consolations in Travel, or the Last Days of a Philosopher." He died in Geneva, May 29, 1829.

DAVY LAMP, the safety-lamp of Sir Humphry Davy, in which a wire-gauze envelope covers the flame-chamber and prevents the passage of flame outward to the explosive atmosphere of the mine, while it allows circulation of air.

DAWES, CHARLES GATES, an American financier and public official; born in Marietta, O., in 1865. He graduated from Marietta College in 1884 and studied law at the Cincinnati Law School. After his admission to the bar in 1886 he practiced law in Lincoln, Neb. In 1894 he left law to engage in business, He was active in politics and was a member of the executive committee of the Republican National Committee in the campaign of 1896. From 1897 to 1902 he was Comptroller of the Currency. He served in the World War in the Engineers, rising to the rank of

brigadier-general. He served in France on the administrative staff of the commander-in-chief of the American Expeditionary Force as chairman of the General Purchasing Board and general purchasing agent. He was also a member of the Allied Purchasing Board and the Liquidation Commission of the Allies. For his services he was awarded the Distinguished Service Medal and the Order of Leopold, King of Belgium. He wrote "The Banking System of the United States" (1892); and "Essays and Speeches" (1915).

DAWES, HENRY LAURENS, an American legislator; born in Cummington, Mass., Oct. 30, 1816. He was graduated at Yale in 1839. Becoming a lawyer, he entered the State Senate as a Republican and in 1857 was elected to Congress, serving in the House until 1873. He was elected to the United States Senate in 1875, and was re-elected in 1881 and 1887. The condition of the Indian tribes especially claimed his attention, and after 1893 he was head of the Commission to the Five Civilized Tribes. He died at Pittsfield, Mass., Feb. 5, 1903.

DAWES' HOLES, minute circular spots on the nucleus of a sun-spot, darker than the rest of the nucleus, and supposed to be the months of tubular orifices penetrating to unknown depths. They were first observed by the astronomer whose name they bear.

DAWSON, capital of Yukon territory, Canada; in the gold region of the Klondike. It is on the E. side of the Yukon river, 575 miles from Juneau. It was founded by Joseph Ladue, a miner, who built the first house here, Sept. 1, 1896. Dawson is the center of the Klondike gold region, and has grown from a mining camp into a prosperous town, with important commercial interests. It is a port of call for steamships from June to October. Pop. (1911) 3,015.

DAWSON, CONINGSBY (WILLIAM), an American author, born at High Wycombe, England, in 1883, the son of William James Dawson. He graduated from Merton College, Cambridge, in 1905, and in the same year came to America, where he traveled as special correspondent for several English newspapers. He was literary adviser to publishers from 1910 to 1913. In 1916 he joined the Canadian 1st Division at the front as lieutenant of the Field Artillery and served until the end of the war. In 1917 he was wounded. After serving with the British Ministry of Information he rejoined the Canadian forces in the spring of 1918. He was again wounded in September of that year. He delivered lectures in the United States under the auspices of the British Mission in November and December, 1918, and in 1919-1920 he lectured throughout the United States on the results of the war. He was the author of "The Worker and Other Poems" (1906); "The Garden Without Walls" (1913); "The Raft" (1914); "Carry On" (1917); "The Glory of the Trenches" (1918); and "The Test of Scarlet" (1919). He also wrote several volumes of poems.

DAWSON (FRANCIS) WARRINGTON, an American writer and lecturer, born in Charleston, S. C., in 1878. He was educated in France and in the Charleston College. He engaged in newspaper work and acted as special correspondent in Spain, Russia, and other countries of Europe. He was American war correspondent with the French Armies from 1914 to 1916. In 1917 he was appointed attaché of the American Embassy at Paris and served as special assistant in that post until 1919. He was well known as a lecturer in the United States and in Europe. He was a member of the first neutral commission sent by the French Ministry of War to investigate the use of asphyxiating gases by the German army on the Anglo-French front in April, 1915. He was the author of "The Scar" (1906); "The Scourge" (1908); and "The True Dimension" (1916).

DAWSON, WILLIAM JAMES, a clergyman and writer, born at Towcester, England, in 1854. He was educated at Didsbury College, Manchester. In 1875 he was ordained Wesleyan minister. He served in several pastorates in England until 1905, when he moved to the United States, becoming pastor of the 1st Presbyterian Church. He lectured widely on literary and historical subjects. He wrote "Makers of English Poetry" (1890); "Makers of English Prose" (1899); "Quest of the Simple Life" (1903); "A Soldier of the Future" (1908); "The Book of Courage" (1911); "The Father of a Soldier" (1917); and "Chalmers Comes Back" (1919). He also wrote several volumes of poems.

DAY, the time taken by the earth to revolve once on its axis. This varies according to the method adopted in making the calculation. A solar day is the interval between the time of the sun's coming to the meridian and returning to it again. Similarly a sidereal day is the interval between the time of a star's coming to the meridian and again returning to it on the immediately subsequent night. A mean solar day is 24 hours long. A mean sidereal day is about 23

hours, 56 minutes, and 4 seconds. The reason of the difference is that the sun appears to go slowly to the E. through the stars, which makes them reach the meridian in a shorter time than he does, if the estimate be made by sun-time. An apparent day is the interval which exists between two successive transits of the sun across the meridian. An astronomical day is a day beginning at 1 P. M. and continuing to the next. It is divided into 24 hours, not into two periods of 12 hours each.

A day, in law, includes the whole 24 hours from midnight to midnight. In reckoning periods of time from a certain event, the day on which the event occurred is excluded. On the other hand, if it be required to prove survival for a certain number of days, it will suffice if the person be alive for any portion, however small, of the last day. While an obligation to pay on a certain day would therefore be theoretically discharged by payment before midnight, the law requires that reasonable hours be observed—*e. g.*, if the payment (as a bill) is at a bank or place of business, it must be within business hours.

Days of Grace.—The time at which a bill is actually due and payable, except in the case of bills payable on demand or at sight, is three days after the time expressed on the face of it, and these three additional days are called days of grace. In England, if the third day of grace fall on a Sunday, Christmas day, Good Friday, or a national fast or thanksgiving day, the bill is payable the day before. If it fall on any of the other bank holidays, or if the last day of grace is a Sunday and the second a bank holiday, the bill is payable on the succeeding business day. Days of grace have now been abolished in many countries, but there are still three allowed in some of the United States, and 10 in Russia. In the United States a bill or note, becoming due on a Sunday or a holiday, is payable on the first business day thereafter.

DAY, HOLMAN FRANCIS, an American writer, born in Vassalboro, Me., in 1865. He graduated from Colby College in 1887, and for many years was engaged in newspaper work in New England. He was a frequent contributor, both of prose and poetry, to magazines, and wrote many novels, including "Rainy Day Railroad War" (1906); "Old King Spruce" (1910); "Blow the Man Down" (1916); "The Rider of the King Log" (1919). He also wrote several plays and published volumes of verse.

DAY, WILLIAM RUFUS, an American jurist; born in Ravenna, O., April 17, 1849. He was graduated from the University of Michigan in 1870, and at the law school of the same institution in 1872. He immediately opened a law office in Canton, O. In 1886 he was elected judge of the Court of Common Pleas and in 1889 was appointed judge of the United States Circuit Court for the Northern District of Ohio, but declined. In 1897 he was appointed Assistant Secretary of State by President McKinley, and in 1898 became Secretary of State, conducting all the negotiations of the Spanish War. He was also made a member of the commission which framed the treaty of peace with Spain in Paris. In 1899 he was appointed a U. S. Circuit judge, and in 1903 to the Supreme bench.

DAYLIGHT SAVING. The benefits to be derived from a change in the hours of general activity, having for its object more daylight leisure and the lessening of work performed by artificial light, had long been a subject of theory before the World War. Germany and Austria were the first to put it into practice in May, 1916, by the simple expedient of advancing the clocks by an hour and following the new schedule during the summer months. The expedient was immediately adopted also in England, Denmark, Holland, France, Italy, and other countries. The movement spread to the United States, and a bill to effect daylight saving was passed by the Senate to take effect Jan. 1, 1918, but remained in committee during the year in the House of Representatives. Following the entry of the United States into the World War an act was passed by Congress in March, 1918, as a result of which the standard time of the United States was advanced one hour on March 31, so to continue to October 27. In 1919 the law again became effective on the last Sunday in March, in accordance with a report submitted to the Director-General of Railroads by the Committee on Transportation of the American Railway Association. The General Order No. 61, issued by the Director-General of Railroads, provided that all clocks and watches in train despatchers' offices and in all other offices open at 2 A. M. should be advanced one hour to indicate 3 A. M. It was further provided that at 2 A. M. of the last Sunday in October all clocks and watches in train despatchers' offices, and in other offices open at the time, should be turned back one hour, to indicate 1 A. M., the trains conforming to the new schedule after the change of time.

The Daylight Saving Law did not receive general acceptance and, in 1919, an active movement was in progress to re-

peal it, particularly among people living in the country and engaged in farming occupations. As a result an act for the repeal of the Daylight Saving Law was passed by both the House of Representatives and the Senate, but was vetoed by the President. The bill was passed, however, in both Houses over the President's veto. In New York City the Board of Aldermen unanimously passed an ordinance providing for the local use of the daylight saving scheme, which was put into effect during the summer of 1920. It thus came about that the people in the city of New York regulated their hours according to local time, while the clocks at the great railroad termini stood at an hour behind that of the other clocks in the city.

DAY LILY, the popular name for a genus of lilies (*Hemerocallis*), a native of temperate Asia and eastern Europe, two species of which (*H. flava* and *H. fulva*) are grown in gardens. They have long radical leaves, and a branched few-flowered scape, with large, handsome blossoms, the segments of which are united into a tube.

DAYTON, a city of Kentucky, in Campbell co. It is on the Chesapeake and Ohio railroad and on the Ohio river. There are manufactures of watch cases and pianos. The city contains the Speers Memorial Hospital, and other public buildings. Pop. (1910) 6,979; (1920) 7,646.

DAYTON, a city and county-seat of Montgomery co., O.; on the Great Miami river at the mouth of the Mad river; the Miami canal, and the Erie, the Chicago, Cleveland, Cincinnati and St. Louis, the Chicago and St. Louis, and other railroads; 60 miles N. E. of Cincinnati.

Business Interests.—The Miami river furnishes abundant water power for the various important manufacturing establishments. The water is carried to the factories by means of canals. Dayton is one of the most important manufacturing cities in the country. The principal articles manufactured are foundry and machine shop products, paper, glucose, bicycles, farming implements, cotton and woolen goods, engines, cash registers, automobiles, sewing machines, railway cars, and other machinery. There are numerous marble and limestone quarries in the vicinity. In 1919 there were 7 National banks and many private banking houses.

Public Interests.—The city is well laid out, and is noted for its costly public buildings, the most notable of which are the old and new county court houses, connected by corridors, the former of marble, and the latter of limestone. The principal charitable institutions include the County Orphan Asylum, the Widows' Home, the Southern Lunatic Asylum of Ohio, and the Central National Soldiers' Home. Other public institutions are St. Elizabeth's Hospital and the Court House. There are over 50 churches in the city. The public school system is of a high order. For secondary and higher instruction there are the Academy of Notre Dame, the English and Classical Training School, and St. Mary's Institute.

History.—Dayton was settled in 1796; incorporated in 1805; and chartered as a city in 1841. Pop. (1900) 85,333; (1910) 116,577; (1920) 152,559.

DAYTONA, a city of Florida, in Volusia co. It is on the Atlantic Ocean, the Halifax river, the Jacksonville-Miami canal, and the Florida East Coast railroad. It is also on the line of the Florida Coastal Island Navigation Company. In recent years it has become a popular summer and winter resort. It has excellent hotels, a library, and an Elks' Home. The principal industries are the growing of oranges and strawberries, and fishing. Pop. (1910) 3,082; (1920) 5,445.

D'AZEGLIO, See AZEGLIO.

DEACON [Lat. *diaconus*, all from Gr. *diakonos* = (as subst.) (1) a servant, a waiting man; (2) a minister of the Church, especially a deacon, a deaconess; (as adj.) serving, serviceable; probably from *diōkō* = to cause to run, to pursue.]

In Scripture.—Omitting the passages in which *diakonos* has a general meaning, three portions of the New Testament refer to the ecclesiastical officers so denominated. In Phil. i: 1, they are mentioned in conjunction with the "bishops," and were evidently of inferior authority to them, for they are mentioned last. In I Tim. iii: 6-13, the proper qualifications requisite for their office, as well as the character which their wives should possess, are pointed out, but no mention is made of the precise duties which they had to discharge. In Rom. xvi: 1, Phebe is described as a servant or deaconess of the Church at Cenchrea, and in commendation of her it is stated that she had been a succorer of many, the Apostle Paul himself being among the number. There is a very general opinion that the first institution of the order of deacons is narrated in Acts vi. If the officers whose election is described in Acts vi. were deacons, then the special duty of that order of men was the distribution of the Church alms to the poor. A "daily ministration" took place in the early apostolic times to

widows who could not support themselves unaided. The majority of these could speak only Aramaic; a minority, Jewish by descent like the former, were Grecians, *i. e.*, spoke Greek, or at least their husbands had done so. The majority monopolized all the attention of the almsgivers, and the representatives of the minority had to complain of neglect. The apostles, being appealed to, felt that it would interfere with the success of their spiritual work if they became mixed up with disputes about the apportionment of money; they advised or commanded that seven men of honest report, *i. e.*, of honorable reputation, full of the Holy Ghost and wisdom, should be sought and appointed almsmen to the Church.

In the Methodist Episcopal Churches.—The junior order of the priesthood, the novitiate being first ordained a deacon, and then after a time, if satisfactory conditions have been fulfilled—such as progress in grace and gifts, and the probation of character—elevated to the full priesthood or eldership.

In the Churches of Rome and England.—A deacon is a spiritual officer ranking beneath the bishops and priests or presbyters. The diaconate may be held at 23 years of age, the priesthood not till 24.

In the Presbyterian Churches.—The orders here are teaching elders, or ministers, ruling elders, generally called simply elders (these two orders looking over the spiritual affairs of the congregation); and deacons (now gradually being displaced in many places by managers), to attend to the more secular matters.

In the Congregational, Baptist, and other Churches.—Deacons are spiritual officers ranking immediately under the minister, and looking after both the spiritual and the temporal concerns of the congregations.

DEACONESS, a female deacon in the early Christian Church. The term is sometimes applied to a sister of mercy, or those ladies who live in community and follow the rule of the Lutheran deaconesses. Deaconesses existed in the 1st century. The office has been revived in the United States, in Germany, and to a certain extent in England.

DEAD, BOOK OF THE, the great funerary work of the ancient Egyptians, who themselves entitled it "Per-em-Hru," "to go forth from (or by) day." It is a collection of prayers and exorcisms composed at various periods for the benefit of the Pilgrim-soul in his journey through Amenti (the Egyptian Hades); and it was in order to provide him with a safe conduct through the perils of that terrible valley that copies of the work, or portions of it, were buried with the mummy in his tomb. Such copies constitute fully one-half of the thousands of extant papyri. A pure text has been published by Edouard Naville in "The Egyptian Deadbook of the 18th and 20th Dynasties" (Berlin, 1886). Dr. Birch's English translation ("Egypt's Place in Universal History," vol. v. 1867), is based on Lepsius' imperfect Turin text (1842).

DEADLY NIGHTSHADE, a plant botanically known as belladonna, yielding an extract of much utility in ophthalmic investigation. The "beauty" implied by the name is in the berries, which are shining black, but are poisonous. The best known antidote to them is vinegar. The leaves of the plant are useful as a medicine, being given in intermittent fevers, palsy, pertussis, amaurosis, cachexia, epilepsy, and ticdouloureux. A remedy much used in homœopathic pharmacy. The name is also given to a subdivision of the genus *Amaryllis*, containing the belladonna lily, a fine flower found in the West Indies.

DEAD MAN'S HILL, an elevation near Verdun, on the Meuse, called Le Mort Homme, which was the scene of fierce fighting during the German effort, from February to July, 1916, to take Verdun. During the entire attack the French held with extraordinary bravery to the northern slopes of the hill, to which on the first surprise they had been driven. Three hundred thousand Germans are held to have been killed or wounded as the price of the gains made in the vicinity. Positions did not change much during the greater part of 1917, though there was much fighting. In August, however, the French by a quick thrust took Le Mort Homme (Dead Man's Hill), Avocourt Wood, Corbeaux and Cumières Woods and other territory with 19,000 prisoners. By the middle of September the French had recovered 100 of the 120 square miles around the hill, seized by the Germans in 1916.

DEAD-MEN'S FINGERS, a popular name for the *Alcyonium*, a genus of polypes, the typical one of the family *alcyonidæ*. It contains many well-known species, such as *A. digitatum*, or sea-finger, and *A. glomeratum*.

DEAD-NETTLE, the common name of the species of plants of the genus *Lamium*, natural order *Labiatæ*, from the resemblance of their leaves to those of the nettle, though they have no stinging property. There are several species found in Great Britain (and now also in North America), as the white dead-

nettle (*L. album*), the red (*L. purpurĕum*), and the yellow (*L. Galeobdŏlon*).

DEAD SEA, the usual name, dating from the time of Jerome, for a most remarkable lake in the S. E. of Palestine, called in the Old Testament The Salt Sea, Sea of the Plain, or East Sea; by Josephus, Lacus Asphaltites; and by the Arabs now, Bahr-Lút, "Sea of Lot." It is 46 miles long, with a breadth of from 5 to 9 miles. Its surface, which is lower than that of any water known, is 1,292 feet below the level of the Mediterranean. The depth of the greater part, the N. section, is about 1,300 feet. The shape is that of an elongated oval, interrupted by a promontory which projects into it from the S. E. The Dead Sea is fed by the Jordan from the N. and by many other streams, but has no apparent outlet. Along the E. and W. borders of the Dead Sea there are lines of bold, and in some cases perpendicular, cliffs. These cliffs are chiefly composed of limestone, and are destitute of vegetation except in the ravines traversed by fresh water streamlets. The N. shores of the lake form an extensive and desolate muddy flat, marked by the blackened trunks of trees, with salt. The S. shore is low, level, and marshy, desolate, and dreary. On this shore is the remarkable ridge of rock-salt, 7 miles long and 300 feet high, called Khashm Usdom (Ridge of Sodom). Lava-beds, pumice-stone, warm springs, sulphur, and volcanic slag prove the presence here of volcanic agencies at some period. The salinity of the waters is adverse to life, though some lower organizations are found in them.

The water of the Dead Sea is characterized by the presence of a large quantity of magnesian and soda salts. Its specific gravity ranges from 1172 to 1227 (pure water being 1000). The proportion of saline matter is so great, that while sea-water contains only 3.5 per cent. of salts, the water of the Dead Sea contains upward of 26 per cent. The evaporation is great, as the heat is intense, and the sea rather contracts than increases. Rain hardly ever falls; the water is nearly as blue and clear as that of the Mediterranean. Owing to the great specific gravity of the water, it is almost impossible for the bather to sink in it, strive as he may. Several of those who have navigated and explored the sea have fallen victims to a fatal fever. For the story of the "Cities of the Plain," see Gen. xix.; but according to Captain Conder, "it is now generally agreed that the Dead Sea and Jordan were formed by a great fault or crack in the earth's surface long before the creation of man. It is vain, therefore, to suppose that the 'cities of the plain' were beneath the present sea."

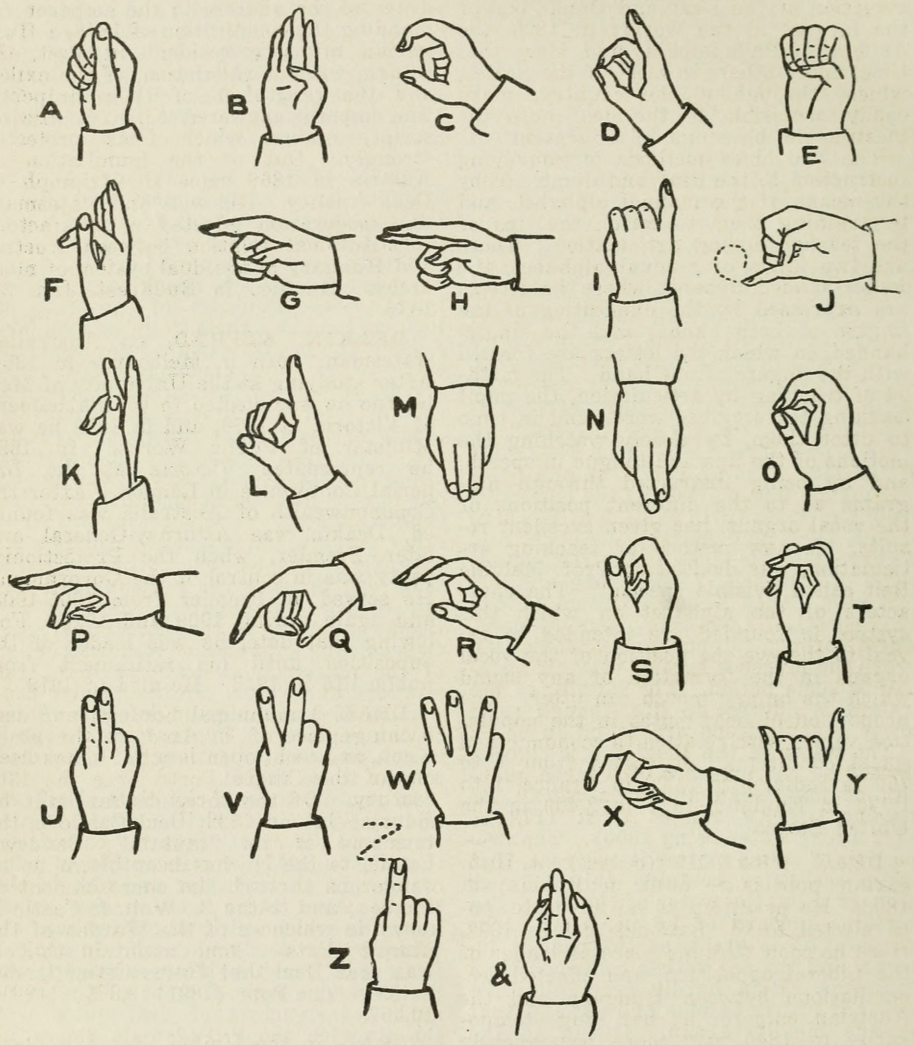
DEADWOOD, a city of South Dakota, the county-seat of Lawrence co. It is on the Chicago and Northwestern, and the Chicago, Burlington and Quincy railroads. It is the financial and commercial center for the mining region of the Black Hills. There are smelting and reduction works, planing mills, foundry, lime works, etc. The city contains a United States assay office, a public library, and a museum.

DEAF AND DUMB, or DEAF-MUTES, persons both deaf and dumb, the dumbness resulting from the deafness which has either existed from birth or from a very early period of life. Such persons are unable to speak because they have not the guidance of the sense of hearing to enable them to imitate sounds. Among the causes assigned for congenital deafness are consanguineous marriages, hereditary transmission, scrofula, certain local or climatic conditions, ill health of the mother during pregnancy, etc. Acquired or accidental deafness, which occurs at all ages, is frequently due to such diseases as smallpox, measles, typhus, paralysis, hydrocephalus and other cerebral affections, but more particularly to scarlet fever, which is somewhat apt to leave the patient deaf, owing to the inflammatory state of the throat extending to the internal ear, and thus causing suppuration and destruction of the extremely delicate parts of the auditory apparatus. In the greater proportion of deaf-mutes no defect is visible or can be detected by anatomical examination, and no applications yet discovered appear to be useful.

In ancient times Aristotle and others, and also in the Christian ages, Augustinus and his contemporaries considered that deaf-mutes were incapable of education. In ancient days and also in the Middle Ages there were a few cases known in which spiritual culture was attained by the deaf and dumb. In ancient Rome two dumb painters attracted attention. The most famous of the more ancient instructors of deaf-mutes was the Spanish monk Pedro de Ponce at Sahagun, in Leon, who taught four deaf and dumb people to speak. In Germany about the same time the court preacher of Brandenburg, Joachim Pascha, succeeded in teaching his deaf and dumb daughter to speak.

In 1648 John Bulwer published the earliest work in England on the instruction of the deaf and dumb. This was followed by Dalgarno's "Ars Signorum" (Art of Signs) in 1661 and Dr. W. D.

Holder's "Elements of Speech." Dr. John Wallis, Savilian Professor of Mathematics at Oxford, is generally supposed to have been the first Englishman to instruct deaf-mutes. In 1743 Pereira, a Spaniard, publicly demonstrated this new art before the French Academy of



DEAF-MUTE ALPHABET

Sciences, which gave its testimony to the success of the method. About the same time the Abbé de l'Épée, introduced a system for the instruction of the deaf and dumb, which was taught with great success in the Royal Parisian Institution. In 1779, through the labors of Samuel Heinicke, the great upholder of the vocal or articulatory system, there was established at Leipzig, for the education of deaf-mutes, a public institution which is still retained at Vienna and throughout Germany. About 20 years previously Thomas Braidwood had established near Edinburgh, in 1760, a deaf and dumb school on the articulating system. This was visited by Dr. Johnson during his tour in Scotland. The first public institution in Great Britain for the gratuitous education of the deaf and dumb was founded at Bermondsey in 1792 by the Rev. Messrs. Townsend and Macon. In 1817, the first American asylum for the deaf-mute was founded at Hartford under the su-

perintendence of Mr. Gallaudet, who was the promotor of a system of teaching styled the "American System," which widely differs from those followed in European schools. From this sprung up, in 1818, the New York Asylum, now known as the New York Institution for the Instruction of the Deaf and Dumb, one of the largest in the world; in 1820, the Asylum of Philadelphia; and, since that time, many others in most of the States, which, throughout the country, make easily accessible to the deaf-mute the inestimable blessings of education.

The two chief methods of conveying instruction to the deaf and dumb are by the means of the manual alphabet, and by training them to watch the lips of the teacher during articulation. There are two kinds of manual alphabet, the double-handed alphabet, where the letters are expressed by the disposition of the fingers of both hands; and the single-handed, in which the letters are formed with the fingers of one hand. The method of teaching by articulation, the pupil learning to recognize words and in time to utter them, by closely watching the motions of the lips and tongue in speech, and by being instructed through diagrams as to the different positions of the vocal organs, has given excellent results. A new method of teaching articulation, was devised by Prof. Melville Bell called "visible speech." The characters of the alphabet on which this system is founded are intended to reveal to the eye the position of the vocal organs in the formation of any sound which the human mouth can utter. The proportion of deaf-mutes in the population varies with relation to economic and social conditions. It varies from 1 to 760 in India, 1 to 1,200 in France, 1 to 1,970 in England, to 1 in 2,400 in the United States.

DEÁK, FRANCIS (dā-ak'), a Hungarian politician; born in Kehida, in 1803. He practiced as an advocate, until elected to the national diet in 1832. Here he soon took his place as leader of the Liberal opposition, and effected reconciliations between Hungary and the Austrian emperor as her king—temporarily in 1840, and more permanently in 1867. After the revolution of March, 1848, he became Minister of Justice in the cabinet of Count Batthyányi, and made every effort to ward off the inevitable war. On Kossuth's coming into power (September, 1848), Deák resigned his portfolio, and after futile attempts at negotiation retired from public affairs. He refused to return to public life till 1860 when a constitution was granted to his country.

Returned by Pest to the diet in 1861, he again became the leader of the Moderate party, while the Extreme party collected round Count Téléki. The death of the latter (May 8) destroyed the only influence which could counterbalance that of Deák; and the diet appointed him to draw up the address to the emperor demanding the constitution of 1848, a Hungarian ministry resident in Pest, the return, without restriction, of the exiles, and the restitution of their property. The emperor answered it by a hostile rescript, against which Deák protested strongly. Out of the humiliation of Austria in 1866 came the triumph of Deák's policy. His wise and statesmanlike moderation effected a satisfactory constitutional relation between Austria and Hungary in the dual system of monarchy. He died in Budapest, Jan. 29, 1876.

DEAKIN, ALFRED, an Australian statesman; born in Melbourne in 1856. After studying at the University of Melbourne he was elected to the Parliament of Victoria in 1879, and in 1883 he was Minister of Public Works. In 1887 he represented Victoria at the Imperial Conference in London. After the Commonwealth of Australia was founded, Deakin was Attorney-General and later Premier, when the Protectionist party was in control of the Government. He served as Premier from 1905-1908, and again during 1909 and 1910. Following that date, he was leader of the opposition until his retirement from public life in 1913. He died in 1919.

DEAL, a municipal borough and seabathing place of England, in the E. of Kent, on a bold open beach. It has been one of the Cinque Ports since the 13th century. Of the three castles built by Henry VIII. in 1539, Deal Castle is the residence of its "captain"; Sandown Castle, to the N., has been blown up as dangerous through the encroachment of the sea; and to the S., Walmer Castle is now the residence of the Warden of the Cinque Ports. Some maintain that it was near Deal that Julius Cæsar landed in 55 B. C. Pop. (1891) 8,898; (1901) 10,557.

DEAL, in the United States, a plank 12 feet long, 11 inches wide, and 2½ inches thick. Deals are sawed of other sizes, but are reduced to that cubic dimension in computing them.

In England, lumber not exceeding 3 inches in thickness and 9 inches wide. The word is applied especially to the wood of the fir. If the planks are 7 inches or less in width, they are called battens, and if less than 6 feet long, deal-ends. Fifty cubic feet of deals are

a load, and 100 feet superficial are a square.

DEALFISH, a genus of deep-sea bony fishes, in the ribbon-fish sub-order of *Acanthopteri*. Some eight species are known, on European coasts and from the W. of South America. They rarely come to the surface. One form (*T. arcticus* or *bagmarus*, the vaagmaer of Icelanders and Norwegians) is occasionally found on North British coasts. It is a large fish, 4 to 6 feet in length, and of a silvery color. The dorsal and caudal fins are red. A smaller species (*T. tænia*) occurs along with others in the Mediterranean.

DE AMICIS, EDMONDO. See AMICIS.

DEAN (literally, a head or chief of 10 men), in the Church of England, an ecclesiastical dignitary in cathedral and collegiate churches, and the head of a chapter, originally said to consist of 10 canons or prebendaries; whence the origin of the term. The presiding head of the faculty in some of the English and Scottish universities. In the Universities of Oxford and Cambridge, an officer deputed to compel the attendance of students at prayers in the chapels of the colleges, and generally, to supervise their conduct at religious service. In the United States the several schools of medicine, law, etc., connected with the universities frequently appoint a dean, whose functions vary with the requirements of his particular institution. The dean of a faculty is its registrar or secretary.

DEAN, BASHFORD, an American zoölogist; born in New York City in 1867. He graduated from the College of the City of New York in 1886 and afterward took post-graduate courses at Columbia. He served as tutor of natural history at the College of the City of New York from 1886 to 1890. In 1891 he was appointed instructor of biology at Columbia University and became successively adjunct professor of zoölogy and professor of vertebrate zoölogy at that university. He was assistant of the New York State Fish Commission from 1886 to 1888, and served as special investigator of the United States Fish Commission. He was for a time director of the Biological Laboratory of Cold Spring Harbor, New York. From 1903 he was curator of herpetology and ichthyology at the American Museum of Natural History. He was also curator of arms and armor at the Metropolitan Museum of Art. He was a member of many learned societies. During the World War he served as major of ordnance in the United States Army, and was a member of the Mission to France, Belgium, and England in 1917. He was the author of several works on biological subjects.

DEATH, the cessation of life; the state of any being, animal, or plant, in which the vital functions have totally and permanently ceased to act. Every blow we strike, every thought we think, is accompanied by the death and disintegration of a certain amount of muscular or nervous fiber as its necessary condition; thus every action of our corporeal life, from its beginning to its close, takes place at the expense of the vitality of a certain amount of organized structure. This is termed molecular death, and, within its proper limits, is obviously essential to the life and well-being of the organism. The cessation of the circulation and respiration may be regarded as constituting somatic death, or the death of the entire organism, which must obviously be shortly followed by the molecular death of every portion of the body. Death happens either from the natural decay of the organism, as in old age, or from some of those derangements or lesions of the vital organs which occur in diseases and injuries. For technical reasons a discrimination should be made between death, decease, and demise. The three principal modes of dying begin at the heart, the brain, or the lungs.

At the approach of death, the mind may be affected in various ways, including dullness of the senses, vacancy of the intellect, extinction of the sentiments, as in natural death from old age, or a peculiar delirium closely resembling dreaming, which is usually of a pleasing and cheerful character. In most diseases of long standing the cessation of the heart's action is gradual, the rate of the pulsation being much increased, but their energy being much impaired. In some acute affections the failure is shown by the irregularity of the pulse, while the force is little altered. In other cases, especially in cerebral diseases, the heart, before finally ceasing to beat, contracts violently and suddenly stops. The respiration is sometimes hurried and panting till just before death, while in other cases it is slow, laborious, and stertorous. There is also a loss of animal heat, beginning at the extremities.

The signs of actual death are (1) the heart's arrest and the gradual extinction of the vital functions; (2) changes in the tissues; (3) change in the external appearance of the body.

(1) The arrest of the circulation and respiration at first sight appears to afford decisive evidence of death, but these

functions may be reduced to so low a condition that it is by no means easy to decide whether or not they are completely annihilated. In cases of apparent drowning, chloroform poisoning, and in newly-born infants, they are frequently suspended and again restored, and cases occasionally occur in which the patient has the power of voluntarily suspending them for a considerable period. The gradual loss of animal heat is an important sign, but in exceptional cases a rise of temperature may take place after death.

(2) The most important among the changes in the tissues is the "rigor mortis," or rigidity of the muscles, which ensues at a varying period after death. It may appear within half an hour, or it may be delayed 20 or 30 hours, according to the nature of the disease; its mean duration is from 24 to 36 hours. It begins in the neck and trunk; then appears, according to most observers, in the upper, and lastly in the lower, extremities; and disappears in the same order.

(3) The most important change in the external appearance of the body is unquestionably the altered color of the surface. Livid spots of various sizes may occur from local congestions during life; but the appearance of a green tint on the skin of the abdomen, accompanied by a separation of the epidermis, is a certain sign that life is extinct.

Death, in a legal point of view, is either natural or civil; the former being the cessation of both physical life and of the legal rights which attach to it, the latter the cessation of the legal rights while the physical life remains. The doctrine of civil death is now abolished except as to cases of outlawry, in which it seems still to be applicable.

DEATH-HEAD MOTH, the largest species of lepidopterous insect found in Great Britain, and systematically known by the name of *Acherontia atropos*. The markings on the back of the thorax very closely resemble a skull, or death's-head; hence the English name. It measures from 4 to 5 inches in expanse. It emits peculiar sounds, somewhat resembling the squeaking of a mouse. It attacks beehives, pillages the honey, and disperses the inhabitants.

DEATH-TICK, a beetle of the genus *Anobium*, an inmate of human dwellings, which makes a ticking sound. The most common form of this very prevalent superstition is the belief that when the death-tick is heard some member of the household will die within 12 months.

DEATH VALLEY, a narrow valley between the Panamint and Funeral Mountains, in California. It is traversed by the Amargosa river, which is usually a dry channel, though probably it was formerly full of water. The level of the valley is covered with salt, supposed to have been brought by the torrents from the surrounding desert and left on the evaporation of the water. Death Valley is considered to be the hottest and dryest place in the United States. A temperature of 122° F. has been observed here. In 1849 a party of emigrants perished here; hence the name. The region is rich in borax, and extensive works have been established to prepare it for the market. Gold quartz is also found in considerable quantities.

DEBÂCLE (dā-bä'kl), a sudden breaking up of ice in a river; used by geologists for any sudden outbreak of water, hurling before it and dispersing stones and other débris.

DEBENTURE, in finance, a certificate or document signed by a legally authorized officer, as an acknowledgment of a debt due to some person; a deed or bond of mortgage on certain property for the repayment to a certain person of a certain sum of money advanced by such person, together with interest thereon at a certain stated rate.

In customs, a certificate entitling the person to whom it is granted to a drawback on certain goods exported, the duties on which have been paid.

In public offices, in some government departments a term used to denote a bond or bill by which the government is charged to pay a creditor or his assigns the money due on auditing his account.

DEBIR, a city of southern Judah, between Hebron and Beersheba, but nearer the former, often mentioned in Scripture and even there identified with Kirjath-sepher and Kirjath-sannah (Joshua xv: 15, 49). It is now a poor village called Ed-Dahariyeh. It must have been very important at the time of the Judges in Israel, for it is even mentioned as "Debir with her suburbs." But there must have been another Debir, for in Joshua xiii: 26, it is mentioned as if on the borders of Gad, on the other side of the Jordan, actually in the opposite direction from Jerusalem. Elsewhere the word is used (Joshua x:3) as the name of an Amorite king of Eglon (now Ajlan or its vicinity) slain by Joshua about 1450 B. C. This Eglon is not far from Ed-Dahariyeh, and probably Debir was a capital of the Amorites, and may have been a predecessor of Jerusalem, for they were all in the heart of later Judah.

DEBORAH, a Hebrew seer or prophetess who lived in the time of the Judges, and by the aid of Barak delivered the N.

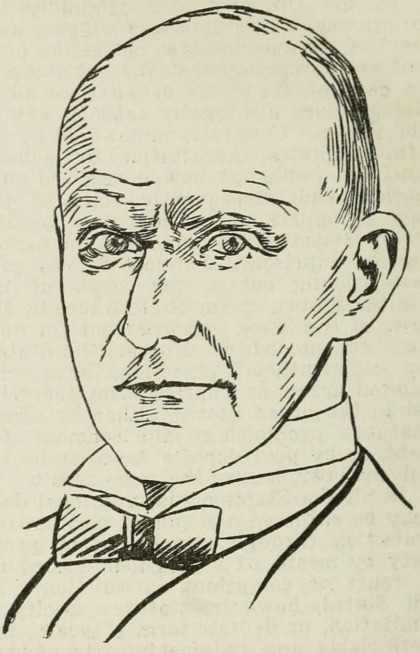
tribes from the oppression of Jabin and secured a peace of 40 years' duration. The triumphal ode (Judges v) attributed to her is a remarkable specimen of Hebrew poetry.

DEBOT, a village community on both banks of the Nile, Upper Egypt, about six miles above the first cataract and not far from ancient Philae. The ruins of the temple of Debot are of great interest. It was built by the Nubian king, Ezekher-Amon, of the time of the earlier Ptolemies and was enlarged by Ptolemy Philometor. The second of the three doorways at entering has a Greek inscription to this Ptolemy and his wife Cleopatra. The first hall has reliefs of Ezekher-Amon, and over the door is an inscription of his. In the sanctuary further along is a granite naos, broken in two and dating from Ptolemy Energetes, second successor of Philometor, both dating from the middle of the second century before Christ. Near by are the remains of one of the permanent Roman camps, mentioned in the *Itinerarium Antonini.* It was called Parembole.

DEBRECZIN (dé-bri'sin), a town of Hungary, on the edge of the great central plain, 113 miles E. of Budapest. Its houses are mostly of a single story; the streets broad and unpaved. Among the principal edifices are the Protestant church and college. Chief manufactures are coarse woolens, leather, soap, tobacco-pipes, casks, etc., and a large trade is done in cattle. Debreczin is considered the headquarters of Hungarian Protestantism. Pop. about 85,000.

DEBRUISED, in heraldry, an epithet applied to a bend or other ordinary placed over some animal, in such a manner as to appear to restrain its freedom of action.

DEBS, EUGENE VICTOR, an American socialist; born in Terre Haute, Ind., Nov. 5, 1855. He received a common school education and became a locomotive fireman. He was elected to the Indiana Legislature in 1885 and was later an official of the Brotherhood of Locomotive Firemen, and, from 1893 to 1897, president of the American Railway Union. He conducted the strike of 1893 in Chicago, and was later sent to jail for contempt, because of his management of the same, though he pleaded innocence of any crime and requested to be tried by a jury and be allowed to summon witnesses in his defense. Since 1897 he has been prominent in the Socialist movement, and in 1900 was the candidate of the Social Democratic party, and in 1904, 1908, 1912, and 1920 of the Socialists, for President of the United States. In 1915 he was appointed Chancellor of the People's College, a working-class institution at Fort Scott, Kan. He was convicted of violating the Espionage Law by opposing the draft laws in 1917, and was sentenced to im-



EUGENE V. DEBS

prisonment for 20 years. In spite of this he was nominated for the presidency by the Socialist party in 1920.

DEBT, that which is due from one person to another; that which one person is bound to pay or perform to another; due; obligation; liability. That which any one is obliged to do or to suffer.

Debt in law is a species of contract whereby a chose in action, or right to a certain sum of money, is mutually acquired and lost; usually divided into debts of record, debts by special contract, and debts by simple contract. A debt of record is a sum which apears to be due by the evidence of a court of record; such as debt of judgment or recognizance. Debt by specialty is where a sum is acknowledged to be due, or becomes due, by instrument under seal; such as a covenant, bond, etc. Both these species of debts, being contracted by a man for himself and his heirs, attach on his lands and tenements, and bind them in the hands of his heir or devisee. Debt by simple contract is either by parol or

by written obligation unsealed; within which class fall bills of exchange, and promissory notes. Debt is also a personal action of contract, in which the plaintiff seeks the recovery of a debt, *i. e.*, a liquidated or certain sum of money alleged to be due to him.

In the United States originally imprisonment of debtors was adopted as a part of the common law, but at the present time imprisonment for debt, except in case of fraud, or of an absconding debtor, does not legally exist in any of the States. Congress, empowered by the United States Constitution to make a uniform bankrupt law, exercised this power, and subsequently repealed the law of imprisonment; and now, by Revised Statutes 990 and 991, no person can be imprisoned for debt by any process issuing out of the courts of the United States, in any State where by the laws of the State imprisonment for debt has been abolished. Most of the States, by constitutional provision, have prohibited arrest or imprisonment for debt, while the other States, either by direct statutes prohibiting imprisonment for debt, or by poor debtors' laws, or by insolvent laws, secure the same result.

In all the States a just and legal debt may be enforced and put in position for collection through attachment of property by means of a judgment issued by a court of competent jurisdiction. In all States, however, statutes specify a limitation, or definite term of years, for both debts and judgments, after which collection may not be enforced. The debt or judgment is then said to be "outlawed."

Such statutes also define the legal rates of interest which may be required on debts, either with or without judgment.

In general the law holds that a debt is an obligation based upon an agreement, which, if not expressed in a contract, verbal or otherwise, is definitely implied in a given transaction. This definition does not apply to taxes, which are held to be imposts levied by authority apart from all agreement; nor yet to fines incurred for misdemeanors, violations of duty, etc. Thus, while real property may be sold for non-payment of taxes, it may be redeemed at any time subsequently by payment of the principal and interest on the taxes due. This constitutes the gravest objection to acquiring a "tax title."

DEBT, NATIONAL. See under Finance in Articles on Countries.

DEBTOR. In ancient times a debtor who could not pay became, with his family and his personal servants, the property of the creditor. In Jewish times children were often given up as pledges for debt, and finally handed over to slavery in payment of debt. Jesus speaks of this, in Matthew xviii: 25, as so customary a thing that it was a part of his folk teaching in a parable. And yet the Mosaic law was so far from contemplating anything of the sort that it did not even permit interest to be taken from an Israelite by an Israelite, and even manumitted the whole debt on the expiry of the Sabbathical year.

The Jewish law also specified various articles of use and necessity as immune from attachment; in this particular, as in others, striving to safeguard all personal and property rights, while, at the same time, preserving social harmony and adherence to high morality. That these laws were subsequently perverted and misinterpreted, so as to permit of the injustices mentioned at the time of Christ, is hardly remarkable. They are in accord with the general trend of development among other nations. Among the ancient Romans the practice of enslavement for debt was an early and long-continued practice.

Imprisonment for debt was less common under the military régime of mediæval Europe than in later times, but was for centuries a much-abused custom in England. Modern jurisprudence allows the attachment of property of all kinds, except, in general, the tools and instruments of livelihood, but discourages the imprisonment of the debtor, except in exceptional cases, as for the non-payment of alimony, or under other unusual cases, generally involving fraud.

A debtor, on being declared bankrupt, makes assignment for the benefit of creditors, which often represents a small percentage of his indebtedness.

DEBUSCOPE (from the inventor, M. Debus, a French optician; and Gr. *skopeō* = I see, a modification of the kaleidoscope. It consists of two highly polished silvered plates, set at an angle of 70° with each other. When placed before a picture or design, an assemblage of flower petals, or other small, colored objects, beautiful designs are formed by their reflected images. The instrument is held stationary while these are copied, and by successively moving it over the object, different combinations of figures are shown, which may be added to the first. It is particularly intended for the use of draftsmen who are required to design ornamental patterns for fabrics.

DEBUSSY, CLAUDE ACHILLE, French composer, born at St. Germain-en-Laye, Aug. 22, 1862. Educated at the Paris Conservatoire, winning the grand

prix de Rome in 1884 with a cantata, "L'Enfant Prodigue." From Rome he sent a setting of Rossetti's *Blessed Damozel,* which was refused by the Institut because of its excessive modernity of style. The rebuff only made him the more determined to adhere to his convictions. His most important compositions are: a "prelude symphonique" to Mallarmé's *Afternoon of a Faun;* orchestral pieces, "Clouds," "Fêtes," and "Sirens"; settings for poems of Verlaine and Baudelaire; a piano suite, "Images"; and his chief work, a lyric drama on Maeterlinck's *Pelléas et Mélisande,* given at Paris, April 30, 1902, and performed with remarkable success at the Manhattan Opera House, New York, Feb. 19, 1908. Among his other compositions may be mentioned "The Sea," "Spring," "Three Nocturnes," "Prose Lyrics," etc. He died in 1918.

DECADE (dek'ād) is sometimes used for the number 10 or for an aggregate of 10. The books of Livy's Roman History are divided into decades. In the French Revolution, decades, each consisting of 10 days, took the place of weeks in the division of the year. The term is now usually applied to an aggregate of 10 years.

DECADENCE, a favorite modern term to express the idea that the successors in some degree are not as strong as the predecessors in the particular department about which an inquiry is made. It is the falling tide from some high-water mark. The word is intentionally offensive, but its use in the history of art is the least objectionable of all. Thus Grecian art attained its highest point of grandeur about 400 B. C., and all Grecian art of later date, some of it most exquisite in its genius, belongs to the decadent side of Grecian art. There are several periods of decadent art that may be found mentioned in the histories, but the one most discussed of late years is that of the French romancists of all schools. Those of the latter part of the last century are called decadents because they are thought less able, and more sensational than their predecessors.

DECAGON, a plane geometrical figure of 10 sides. When the sides are equal, the figure is called a regular decagon.

DECALCOMANIE, a transferable picture or pattern, used generally for decoration, as on chinaware. The designs are printed lithographically on thin paper or foil, which is afterward attached face down to a thick porus paper, which serves to support it. It is applied to the surface to be decorated by moistening the film of gum or cement on the back of the design, after which the paper carrier is thoroughly wetted and peeled off, leaving the design behind.

DECALOGUE, the Ten Commandments given by God to Moses on Mount Sinai. They were first introduced into the liturgy of the Church of England, in the prayerbook of Edward VI., in 1552.

DECAMERON (de-kam'e-ron), anything of 10 days' occurrence; also the title given to a collection of tales by Boccaccio, written in 10 parts, each part containing 10 stories, and being supposed to occupy one day in the narration. Boccaccio represents the stories as being told by seven ladies and three gentlemen, who had fled from Florence into the country to escape the fearful plague of 1348, and who had no other means of passing the time.

DE CANDOLLE, AUGUSTIN PYRAME (de-kon-dol'), a Swiss botanist, descended from an ancient noble family of Provence; born in Geneva, Feb. 4, 1778. In 1796-1797 he studied chemistry, physics, and botany in Paris, where in 1797 his earliest work, on lichens, was published. Other works quickly followed, including his "Astragalogia" (1802), and "Essays on the Medicinal Properties of Plants" (1804). In 1802 he was elected to an honorary professorship in the Academy of Geneva, and delivered his first botanical lectures in the Collège de France in 1804. His "French Flora" appeared in 1805. Employed by the government, he visited all parts of France and Italy in 1806-1812, investigating their botany and agriculture. He was appointed in 1807 to a chair at Montpellier, where he lived from 1810 to 1816; he then retired to Geneva where a Professorship of Botany was founded for him, and where he spent the remainder of his life. He died Sept. 9, 1841. Among his greatest works is "Natural System of the Vegetable Kingdom" (vols. i. and ii., 1818-1821). It was commenced on too grand a scale, but continued within more reasonable limits in the "Preliminary View of the National System of the Vegetable Kingdom" (17 vols. 1824-1873, the last 10 by his son and others). De Candolle died in 1841, bequeathing his collections —including a herbarium of more than 70,000 species of plants—to his son, ALPHONSE DE CANDOLLE (born 1806). That son, himself a botanist of wide fame, also published several works of note, the most important being "Geographical Botany" (2 vols. 1855), and "Origin of Cultivated Plants" (1883). He also edited the "Memoirs" of his father (1862). He died April 9, 1893.

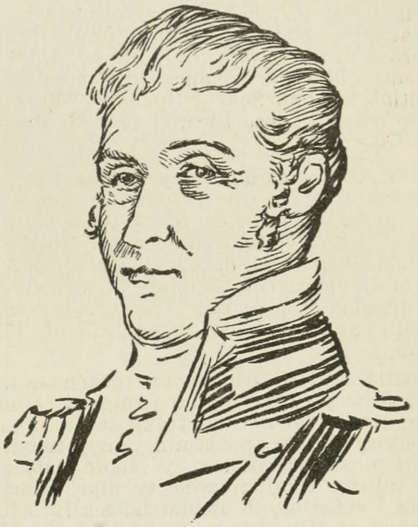
DECAPODA. (1) The highest order of crustaceans, so called from having five pairs of legs. They are sub-divided into *brachyura*, the short-tailed decapods or crabs; *macrura*, or long-tailed, including the shrimp, lobster, prawn, crayfish, etc.; and *anomura*, of which the hermit-crab is an example. (2) One of the two divisions of the dibranchiate cuttlefishes (the other being the *octopoda*). They have two arms longer than the other eight, and bear the suctorial disks only at the extremities.

DECAPOLIS (de-kap'ō-lis), a country in Palestine, which contains 10 principal cities, on both sides of the Jordan. According to Pliny, they were Scythopolis, Philadelphia, Raphanæ, Gadara, Hippos, Dios, Pella, Gerasa, Canatha, and Damascus. Josephus inserts Otopos instead of Canatha.

DECATUR, town and county-seat of De Kalb co., Ga.; on the Georgia railroad; 6 miles E. of Atlanta. It is a noted summer and winter resort on account of its fine climate; is the seat of the Agnes Scott Institute for Young Ladies, and has newspapers, electric lights, and railway to Atlanta, and a National bank. A battle was fought here, July 20, 1864, between a portion of Sherman's army, under General Thomas, and the Confederates under General Hood, the latter retreating at nightfall. The Union loss was 1,500 in killed and wounded. The Confederate loss was estimated by General Sherman at not less than 5,000. Pop. (1910) 2,466; (1920) 6,150.

DECATUR, a city and county-seat of Macon co., Ill.; on the Sangamon river, and the Wabash, the Illinois Central, and the Cincinnati, Hamilton and Dayton railroads; 173 miles S. W. of Chicago. Decatur is in the midst of the famous Illinois corn belt, and is the trade center of several counties. It has railroad car shops, iron works, flour mills, planing mills, and manufactories of farming implements, carriages, engines, boilers, water works equipment, electric light fixtures and soda fountains, and linseed oil. There are many churches, National and other banks, several newspapers, a library, James Millikin University, a hospital, parks, etc. Pop. (1910) 31,140; (1920) 43,818.

DECATUR, STEPHEN, an American naval officer; born in Sinnepuxent, Md., Jan. 5, 1779. He was of French descent, and obtained a midshipman's warrant in 1798. He saw some service against the French, and was commissioned lieutenant in the following year; and at the close of the French war in 1801 he was one of the 36 officers of that rank retained in the reduced strength of the navy. In the war with Tripoli (1801-1805), his brilliant achievement of boarding and burning the captured "Philadelphia" in the harbor of Tripoli, and then escaping under the fire of 141 guns, Nelson pronounced "the most daring act of the age." For this he received his commission as captain in 1804; in 1810 he was appointed commodore. In the war with England in 1812 he captured the frigate "Macedonian," but in 1814 he was obliged to surrender, after a resistance



STEPHEN DECATUR

that cost him a fourth of his crew, to four British frigates. In 1815 he chastised the Algerines for their piracy, and obtained indemnities from the Bey of Tunis and the Pasha of Tripoli. He was appointed a Navy Commissioner in 1816, and was killed in a duel by Commodore James Barron, near Bladensburg, Md., March 22, 1820.

DECAZES (de-kāz'), **ELIE, DUKE**, French minister, born Sept. 28, 1780, in St. Martin de Laye, Gironde, an advocate in Libourne; became in 1805 judge in the Seine Tribunal, and in 1806 was called by King Louis to the Hague, Holland. Later he returned to France and was adviser for Bonaparte's mother, and in the Supreme Court of the French Empire. When Bonaparte fell he turned his allegiance to the Bourbons. He became the Prefect of Police for Paris, and in 1815 Minister of Police in the Cabinet, and was made Count. He married the rich heiress of Sainte-Aulaire

and was made at that time Duke of Glücksbjerg by the King of Denmark. He turned Louis XVIII. into more liberal courses and was the active member of Dessoles' moderate-Liberal Ministry of 1918, having himself the Ministry of the Interior. The ultra-royalists accused him of complicity in the murder of the Duke de Berry, and forced his dismissal in 1820. The King made him Duke, however, and he retired to found the great coal and iron works of Decazeville. He died Oct. 24, 1860.

DECCAN, a term, rather of historical interest than of actual use, applied sometimes to the whole peninsula of Hindustan to the S. of the Vindhya Mountains, which separate it from the basin of the Ganges; and sometimes restricted to that portion of the same which is rather vaguely bounded on the N. by the Nerbudda, which falls into the Gulf of Cambay, and on the S. by the Kistna or Krishna, a tributary of the Bay of Bengal.

DECEBALUS (de-seb'a-lus), the name of several Dacian kings, or perhaps a general title of honor borne by them. One of them distinguished himself by his opposition to the Roman arms during the reigns of Domitian and Trajan. He entered the province of Mœsia, defeated and killed Appius Sabinus, the Roman governor, and captured many important towns and fortresses. Domitian agreed to pay him a yearly tribute, which was continued by Nerva, but refused by Trajan, who subdued Dacia, and Decebalus, to escape falling into the hands of the victors, committed suicide.

DECEMBER, the last month of the year in the old Roman calendar, before the time of Julius Cæsar, the year began with March, and that which is now the 12th was then the 10th month; hence the name (*decem* "10"). Our Saxon ancesters called it Mindwinter - month and Yule-month.

DECEMVIR (dē-sem'ver), one of a body of 10 magistrates, in whom was vested the sole government of Rome for a period of two years, from 449 B. C. to 447 B. C. The brutal and licentious conduct of one of the number, Appius Claudius, caused their downfall in the latter year.

DECEPTION ISLAND, a volcanic island belonging to the South Shetland group in the Antarctic Ocean, directly S. of Cape Horn. Amid its ice-covered rocks lies a crater-lake, five miles in circumference, surrounded by hot springs.

DECHENITE (named after the German geologist, Von Dechen), a red or yellow greasy mineral, occurring massive, botryoidal, nodular, stalactitic, and at times slightly columnar. Found in Germany.

DECIDUOUS TREES, those which annually lose and renew their leaves. In cold and temperate countries the fall of the leaf in autumn, and the restoration of verdure to the woods in spring, are among the most familiar phenomena of nature. The greater part of the trees and shrubs of temperate regions are deciduous; but within the tropics the forest retains always its luxuriance of foliage, except in countries where the dry season is extremely marked. Trees not deciduous are called evergreen.

DECIMAL ARITHMETIC, the common system of arithmetic, in which the figures represent a different value, progressing or decreasing by tens; the value increasing tenfold for each place nearer to the left hand, and decreasing tenfold for each place nearer the right hand. Also that part of the science of numerical calculation which treats of decimal fractions.

DECIMAL FRACTION, a fraction whose denominator is a decimal or power of 10. Thus $\frac{1234}{100}$ is a decimal fraction. It may be decomposed into the sum

$$\frac{1000}{100} + \frac{200}{100} + \frac{30}{100} + \frac{4}{100}$$

$$= 10 + 2 + \frac{3}{10} + \frac{4}{100}$$

By an obvious extension of the method of local values, where each digit has 10 times the value of the like digit which immediately succeeds it, the above decimal fraction may clearly be written more concisely in the form 12.34, where the decimal point after the two merely serves to indicate which digit represents units. In this abbreviated form a decimal fraction is termed a decimal. For the purpose of indicating the unit's place, other and less objectionable methods have been proposed. Sir Isaac Newton's method, however, of using a point, placed for distinction near the top of the figures, is the one most commonly employed. The operations of addition, subtraction, multiplication, and division may be applied to decimals in exactly the same manner as to integers; hence their great utility. They present, nevertheless, this disadvantage, that comparatively few fractional quantities or remainders can be exactly expressed by them; in other words, the greater number of common fractions cannot be

reduced, as it is called, to decimal fractions, without leaving a remainder. Common fractions, such as 1-2, 2-3, 1-4, 3-7, and 9-25, for instance, can be reduced to decimal fractions only by multiplying the numerator and denominator of each by such a number as will convert the denominator into 10, or 100, 1,000, etc. (The common process is merely an abridgement of this.) But that is possible only when the denominator divides 10, or 100, without remainder. Thus, of the above denominators, 2 is contained in 10, 5 times; 4 in 100, 25 times; and 25 in 100, 4 times; therefore,

$$\frac{1}{2} = \frac{1\times5}{2\times5} = \frac{5}{10} = .5; \quad \frac{1}{4} = \frac{1\times25}{4\times25} = \frac{25}{100} = .25; \quad \frac{9}{25} = \frac{9\times4}{25\times4} = \frac{36}{100} .36$$

But neither 3 nor 7 will divide 10, or any power of 10; and therefore these numbers cannot produce powers of 10 by multiplication. In such cases we can only approximate to the value of the fraction.

DECIMAL SYSTEM, the name given to any system of weights, measures, or money in which the unit is always multiplied by 10 or some power of 10 to give a higher denomination, and divided by 10 or a power of 10 for a lower denomination. This system has been rigidly carried out in France, and the principle is observed in the coinage of Belgium, Italy, Spain, Portugal, the United States, and other countries. To express the higher denominations, that is to say, the unit multiplied by 10, 100, 1,000, 10,000, the French make use of the prefixes *déca, hecta, kilo, myria,* derived from the Greek; thus the meter being the unit of length, decameter is 10 meters, hectometer 100 meters, kilometer 1,000 meters. To express lower denominations, that is, tenths, hundredths, etc., the Latin prefixes *déci, centi, milli* are used in the same way; thus a centiliter is the hundredth part of a liter, deciliter the tenth part of a liter. The basis of the whole system is the linear measure, the unit of which is the meter, supposed to be the ten-millionth part of a quadrant of the earth's meridian (39.37 inches). The square of 10 meters, or square decameter, called an are, is the unit of surface measure. The cube of the tenth part of the meter, or cubic decimeter, called liter, is the unit of liquid capacity. The cube of the meter, called a stère, is the unit of solid measure. The weight of a cubic centimeter of distilled water at 39.2° F. (4° C.), called a gramme, is the unit of weight. The unit of money is the franc, which is divided into decimes and centimes.

DECIUS (dē'shus), a Roman emperor; born in Pannonia, and succeeded Philippus, whom he defeated, in 249. He distinguished himself by an expedition against the Goths, and by persecuting the Christians. In his march against the Goths he entered a morass, where he and his army perished in an attack of the enemy, A. D. 251.

DECK, a horizontal platform or floor extending from side to side of a ship, and formed of planking supported by the beams. In ships of large size there are several decks one over the other. The quarter-deck is that above the upper-deck, reaching forward from the stern to the gangway.

DECKER, THOMAS. See DEKKER, THOMAS.

DECLARATION. (1) That part of the process or pleadings in which a statement of the plaintiff's complaint against the defendant is set forth, with the additional circumstances of time and place, when and where the injury was committed where these are requisite. (2) A simple affirmation allowed in certain cases to be taken instead of an oath or solemn affirmation. (3) The statement made by a prisoner on being arrested on suspicion of a crime, which is taken down in writing.

DECLARATION OF INDEPENDENCE, a document drawn up by a committee of the American Congress, consisting of Thomas Jefferson, of Virginia; John Adams, of Massachusetts; Roger Sherman, of Connecticut; Robert R. Livingston, of New York; and Benjamin Franklin, of Pennsylvania. A draft was reported by this committee on June 28. On July 2 a resolution was adopted declaring the colonies free and independent States, and on July 4, the Declaration of Independence was agreed to, engrossed on paper, and signed by John Hancock, President. It was afterward engrossed on parchment and signed by the representatives of the States as below. The independence of the United States was acknowledged by France, Jan. 16, 1778, and by Holland, April 19, 1782; and provisional articles of peace were signed by England, Sept. 3, 1782.

The Declaration, as agreed to, follows:

A DECLARATION

BY THE REPRESENTATIVES OF THE UNITED STATES OF AMERICA, IN CONGRESS ASSEMBLED

When, in the course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume, among the powers of

the earth, the separate, and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal; that they are endowed by their Creator with certain unalienable rights; that among these, are life, liberty, and the pursuit of happiness. That to secure these rights, governments are instituted among men, deriving their just powers from the consent of the governed; that, whenever any form of government becomes destructive of these ends, it is the right of the people to alter or to abolish it, and to institute a new government, laying its foundation on such principles, and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness. Prudence, indeed, will dictate that governments long established should not be changed for light and transient causes; and, accordingly, all experience hath shown, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But, when a long train of abuses and usurpations, pursuing invariably the same object, evinces a design to reduce them under absolute despotism, it is their right, it is their duty, to throw off such government, and to provide new guards for their future security. Such has been the patient sufferance of these colonies, and such is now the necessity which constrains them to alter their former systems of government. The history of the present King of Great Britain is a history of repeated injuries and usurpations, all having, in direct object, the establishment of an absolute tyranny over these States. To prove this, let facts be submitted to a candid world:

He has refused to assent to laws the most wholesome and necessary for the public good.

He has forbidden his governors to pass laws of immediate and pressing importance, unless suspended in their operation till his assent should be obtained; and, when so suspended, he has utterly neglected to attend to them.

He has refused to pass other laws for the accommodation of large districts of people, unless those people would relinquish the right of representation in the legislature; a right inestimable to them, and formidable to tyrants only.

He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public records, for the sole purpose of fatiguing them into compliance with his measures.

He has dissolved representative houses repeatedly, for opposing, with manly firmness, his invasions on the rights of the people.

He has refused, for a long time after such dissolutions, to cause others to be elected; whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise; the State remaining, in the meantime, exposed to all the dangers of invasion from without, and convulsions within.

He has endeavored to prevent the population of these States; for that purpose, obstructing the laws for naturalization of foreigners; refusing to pass others to encourage their migration hither, and raising the conditions of new appropriations of lands.

He has obstructed the administration of justice, by refusing his assent to laws for establishing judiciary powers.

He has made judges dependent on his will alone, for the tenure of their offices, and the amount and payment of their salaries.

He has erected a multitude of new offices, and sent hither swarms of officers to harass our people, and eat out of their substance.

He has kept among us, in times of peace, standing armies without the consent of our legislatures.

He has affected to render the military independent of, and superior to, the civil power.

He has combined, with others, to subject us to a jurisdiction foreign to our constitution, and unacknowledged by our laws; giving his assent to their acts of pretended legislation:

For quartering large bodies of armed troops among us:

For protecting them by a mock trial from punishment, for any murders which they should commit on the inhabitants of these States:

For cutting off our trade with all parts of the world:

For imposing taxes on us without our consent:

For depriving us, in many cases, of the benefit of trial by jury:

For transporting us beyond seas to be tried for pretended offenses:

For abolishing the free system of English laws in a neighboring province, establishing therein an arbitrary government, and enlarging its boundaries, so as to render it at once an example and fit instrument for introducing the same absolute rule into these colonies:

For taking away our charters, abolishing our most valuable laws, and altering, fundamentally, the powers of our governments:

For suspending our own legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever:

He has abdicated government here, by declaring us out of his protection, and waging war against us.

He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people.

He is, at this time, transporting large armies of foreign mercenaries to complete the works of death, desolation, and tyranny, already begun, with circumstances of cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the head of a civilized nation.

He has constrained our fellow-citizens, taken captive on the high seas, to bear arms against their country, to become the executioners of their friends and brethren, or to fall themselves by their hands.

He has excited domestic insurrections amongst us, and has endeavored to bring on the inhabitants of our frontiers, the merciless Indian savages, whose known rule of warfare is an undistinguished destruction, of all ages, sexes, and conditions.

In every stage of these oppressions, we have petitioned for redress, in the most humble terms; our repeated petitions have been answered only by repeated injury. A prince, whose character is thus marked by every act which may define a tyrant, is unfit to be the ruler of a free people.

Nor have we been wanting in attention to our British brethren. We have warned them, from time to time, of attempts made by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them, by the ties of our common kindred, to disavow these usurpations, which would inevitably interrupt our connections and correspondence. They, too, have been deaf to the voice of justice and consanguinity. We must, therefore, acquiesce in the necessity, which denounces our separation, and hold them, as we hold the rest of mankind, enemies in war—in peace, friends.

We, therefore, the representatives of the United States of America, in General Congress assembled, appealing to the Supreme Judge of the World for the rectitude of our intentions, do, in the name, and by the authority of the good people of these colonies, solemnly publish and declare, That these United Colonies are, and of right ought to be, Free and Independent States; that they are absolved from all allegiance to the British crown, and that all political connection between them and the State of Great Britain is, and ought to be, totally dissolved; and that as free and independent States, they have full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things which inde-

pendent States may of right do. And for the support of this declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other, our lives, our fortunes, and our sacred honor.

JOHN HANCOCK.

NEW HAMPSHIRE.—Josiah Bartlett, Wm. Whipple, Matthew Thornton.

MASSACHUSETTS BAY.—Saml. Adams, John Adams, Robt. Treat Paine, Elbridge Gerry.

RHODE ISLAND, ETC.—Steph. Hopkins, William Ellery.

CONNECTICUT.—Roger Sherman, Sam'l Huntington, Wm. Williams, Oliver Wolcott.

NEW YORK.—Wm. Floyd, Phil. Livingston, Frans. Lewis, Lewis Morris.

NEW JERSEY.—Richd. Stockton, Jno. Witherspoon, Frans. Hopkinson, John Hart, Abra. Clark.

PENNSYLVANIA.—Robt. Morris, Benjamin Rush, Benja. Franklin, John Morton, Geo. Clymer, Jas. Smith, Geo. Taylor, James Wilson, Geo. Ross.

DELAWARE.—Cæsar Rodney, Geo. Read, Tho. M'Kean.

MARYLAND.—Samuel Chase, Wm. Paca, Thos. Stone, Charles Carroll of Carrollton.

VIRGINIA.—George Wythe, Richard Henry Lee, Thos. Jefferson, Benja. Harrison, Thos. Nelson, Jr., Francis Lightfoot Lee, Carter Braxton.

NORTH CAROLINA. — Wm. Hooper, Joseph Hewes, John Penn.

SOUTH CAROLINA.—Edward Rutledge, Thomas Heyward, Jr., Thomas Lynch, Jr., Arthur Middleton.

GEORGIA.—Button Gwinnett, Lyman Hall, Geo. Walton.

DECLARATION OF RIGHTS, a declaration drawn up by Parliament, and presented to William III. and Mary on their acceptance of the Crown of England, 1689. In it Parliament claimed the right of Englishmen to keep arms for their own defense; that the election of members of Parliament ought to be free; that no excessive fines or unusual punishments should be inflicted; that money should not be raised without the consent of Parliament; that a standing army must not be raised or kept up in times of peace without the consent of Parliament, etc. These articles were afterward embodied in the Bill of Rights.

DECLENSION, in grammar, the aggregate of the inflections or changes of form which nouns, pronouns, and adjectives receive in certain languages according to their meaning or relation to other words in a sentence, such variations being comprehended under the three heads of number, gender, and case, the latter being the most numerous.

DECLINATION, in astronomy, the distance of a heavenly body from the celestial equator (equinoctial), measured on a great circle passing through the pole and also through the body. It is said to be N. or S. according as the body is N. or S. of the equator. Great circles passing through the poles, and cutting the equator at right angles, are called circles of declination. Twenty-four circles of declination, dividing the equator into 24 arcs of 15° each, are called hour circles or horary circles. Declination of the compass or needle, or magnetic declination, is the variation of the magnetic needle from the true meridian of a place. This is different at different places, and at the same place at different times.

DECLINOMETER (dek-li-nom'e-ter), an instrument for determining the magnetic declination, and for observing its variations. In magnetic observatories there are permanent instruments of this kind, and they are now commonly made self-registering. Such instruments register the small hourly and annual variations in declination, and also the variations due to magnetic storms.

DECOCTION, the term applied in pharmacy to the solution procured by boiling an organic substance with water.

DECOLORIMETER (de-kol-ō-rim'e-ter), an instrument for determining the power of portions of bone-black or animal charcoal to abstract coloring matter.

DECOMPOSITION, the rather comprehensive term applied to the breaking up of complex substances or substances of delicate stability, into others which are less complex or more stable. The term decomposition is constantly applied in chemistry to the changes which compounds undergo in the most varied circumstances when subjected to change of conditions.

DE COPPET, CAMILLE, a Swiss statesman and former president of the Republic. He was born in the canton of Vaud, 1862, and received his education in the cantonal schools. As a young man he engaged in politics, attaching himself to the Radical Democrat party. He soon distinguished himself by his political ability and took a foremost position at the head of his party. In 1912 he became member of the Federal Council; later he became head of the War Department. Finally be was elected President of the Federal Council of Switzerland for 1916.

DECORATION DAY, a day set apart for decorating the graves of soldiers and sailors who fell in the American Civil

War (1861-1865) and in other wars. The practice of setting aside a day to visit the graves of the fallen soldiers recall the memory of their noble deeds, and strew their tombs with flowers, took its rise early in the Civil War; first in particular places, here a city, there a village, or it might be a county. In time, many State Legislatures were induced to make a given day a legal holiday for this purpose, and the President and governors were led to unite in recommending the observance of the same day (May 30), now known as "Decoration Day," in every State of the Union. In the Southern States various days in April are set apart for decorating the graves of the Confederate dead, and the name "Memorial Day" is more commonly used there than Decoration Day.

DECORATIONS, the badges, medals, and ribbons of any order of nobility or merit. The most noted are those of the Order of the Garter, of the Legion of Honor, of the Loyal Legion, and the several European decorations bestowed by sovereigns. American citizens holding office under the United States government are not permitted to accept decorations from foreign rulers without the consent of Congress. See SERVICE MEDALS and DECORATIONS.

DECORATIVE ART, that form of art that has for its purpose the appropriate adornment of some utilitarian object, thereby adding to its beauty, but not to its usefulness. It differs from the painter's art by being subordinate to the article to which it is applied. It may be divided into (1) architectural decoration and (2) design. Architectural decoration applied to the adornment of special buildings or to the symmetrical combination of buildings in cities is either plastic or chromatic. Plastic decoration may be (1) purely architectural, as for instance, buttresses, cornices, and columns and their capitals, which, while being necessary parts of the building, are carved or molded into beautiful forms; (2) purely ornamental, like flower or scroll work applied to surfaces; or (3) purely plastic like caryatids, or figures of men or animals used in special niches. Chromatic decoration may be done by means of painting in oils or distemper, of mosaics in stone, glass or brick, or of bronze, or other metals. Interior mural painting is also an important form of decoration.

Design is applied to objects of common use, such as fabrics, wall paper, furniture, household utensils, books and the like, there being few things so utilitarian as to show no trace of it. It is expressed in both form and color.

This is the earliest form of art, as the work of prehistoric man on bone and weapon shows, beginning as a pictorial representation of their exploits; and also made manifest as an instinct of the race by the way savages tattoo their bodies, carve their totem poles or weapons, weave patterns into their blankets, and decorate their utensils and wigwams.

The Greeks reached a high degree of perfection in decorative art, but their efforts were especially applied to their temples and public buildings, and purely architectural. The Romans, especially in later times, showed great skill in frescoing the walls of palaces and private houses with beautiful or grotesque designs, as well as in applied design.

In modern times the French may be called the masters of decorative art, but since the beginning of the 20th century a group of men and women in England and in the United States have attained supremacy in applied design. Mural painting has again come to the front in France, while the United States shows some of the finest examples of modern architectural design and decoration in such buildings as the Boston Public Library and the Congressional Library in Washington.

DE COSTA, BENJAMIN FRANKLIN, an American clergyman and writer; born in Charlestown, Mass., July 10, 1831. Included in his many publications are: "The Pre-Columbian Discovery of America by the Northmen" (1869); "The Moabite Stone" (1870); and "The Rector of Roxburgh," a novel under the pen-name of "William Hickling" (1873). He became president (1884) of the first branch of the "White Cross Society," of which he was the organizer. He died in 1904.

DECOY, a place into which wild fowls are decoyed in order to be caught. A decoy pond is kept only in a secluded situation. Several channels or pipes of a curved form, covered with light hooped net-work, lead from the pond in various directions. The wild fowl are enticed to enter the wide mouth of the channel by tamed ducks, also called decoys, trained for the purpose, or by grain scattered on the water. When they have got well into the covered channel they are surprised by the decoy-man and his dog, and driven up into the funnel net at the far end, where they are easily caught. The details differ in different cases, but this is the general principle of the contrivance.

DECREE, in general, an order, edict, or law made by a superior as a rule to govern inferiors. In law it is a judicial decision or determination of a litigated

cause. Formerly, in England, the term was specially used for the judgment of a court of equity, but the word judgment is now used in reference to the decisions of all the divisions of the Supreme Court. The word is still used in Scotland for the final judgment of a court, frequently in the form decreet.

DECRESCENT, a heraldic term by which the wane of the moon is indicated. A moon decrescent is a half-moon with her horns turned to the (heraldic) sinister—*i. e.*, the right of the spectator.

DECRETALS, a general name for the Papal decrees, comprehending the rescripts (answers to inquiries and petitions), decrees (judicial decisions by the *Rota Romana*), mandates (official instructions for ecclesiastical officers, courts, etc.), edicts (Papal ordinances in general), and general resolutions of the councils. The decretals form a most important portion of the Roman Catholic canon law, the authoritative collection of them being that made by the orders of Gregory IX. and published in 1234.

DEDHAM, a town of Massachusetts, the county-seat of Norfolk co. It includes three villages and is on the Charles river, and on the New York, New Haven and Hartford railroad. Though it is chiefly a residential suburb of Boston, it has important industries, including manufacturies of cotton and woolen goods, carpets, handkerchiefs, and pottery. The notable buildings include a memorial hall, a public library, and the Historical Society building. It also contains a county court house, a jail, and a house of correction. The town was settled in 1636 and was incorporated in the same year. The first free school in America was established here in 1645. Pop. (1910) 9,284; (1920) 10,792.

DEDUCTION, in logic, as opposed to induction, is the method of reasoning from generals to particulars, as the latter is from particulars to generals. Induction is the mode by which all the materials of knowledge are brought to the mind and analyzed; deductions, the process by which the knowledge thus acquired is utilized, and by which new and more complicated inductions are rendered possible. Thus every step in a deduction is also an induction.

DEE, the name of several British rivers. (1) A river of Scotland, partly in Kincardineshire, but chiefly in Aberdeenshire, one of the most finely wooded and one of the best salmon rivers in Great Britain. It rises on the S. W. border of Aberdeenshire, and flows generally E. 87 miles to the German ocean, having Aberdeen at its mouth. (2) A river of north Wales and Cheshire; rises in Lake Bala, Merionethshire; flows N. E., N., and N. W. to the Irish Sea 20 miles below Chester; length, about 80 miles. The ancient Britons held its waters sacred. (3) A river of Scotland, county of Kirkcudbright, rises in Loch Dee, a lonely lake, 7 furlongs long and from 1⅓ to 4 furlongs wide, situated among the western hills. It flows S. E. and S., and falls into Kirkcudbright Bay; length, 38 miles.

DEED, an instrument in writing or in print, or partly in each, comprehending the term of a contract or agreement, and the evidence of its due execution between parties legally capable of entering into a contract or agreement.

In the United States, the formalities required for the transfer of real estate are governed by local laws. Generally throughout the States, signing, sealing, attestation, acknowledgment, and delivery are the essential requisites of a valid deed of conveyance. The usual form of attestation being "signed, sealed, acknowledged, and delivered in the presence of us witnesses," then follow the names of the subscribing witnesses. The grantor must himself sign the deed, or if it is signed by his agent he must adopt the signature as his own in the presence of the subscribing witnesses and the commissioner or other qualified officer. In the United States, a "deed," technically speaking, is an instrument under seal; hence a seal, although a mere formality, is essential, except in those States in which seals have been abolished by statute. Neither wax nor wafer is necessary for a seal, although a wafer is generally used. A scroll with a pen inclosing the letters "L. S." is a seal within the meaning of the law, if it is the intention of the party appending it to adopt it as his seal, and by its use a specialty is created, the same as by the use of wax or wafer. It is not necessary to refer to the fact of sealing in the attestation clause. The number of witnesses required is governed by statutes in most of the States. Generally two are required, but in some of the States only one witness is necessary if the grantor can read. It has been held that independent of any statute, a deed signed, sealed, and delivered, without being acknowledged or recorded, is valid as between the parties and their privies, but the provisions of a local statute as to the execution of a deed must be strictly followed, or the deed is inoperative.

Delivery, although essential to the validity of a deed, need not be formally made in the presence of witnesses, but

may be a matter of circumstance. A deed takes effect from the date of actual delivery, or the date of record. Everywhere in the United States it is the law that deeds of conveyance must be recorded either in the proper office of the county in which the land lies—or if the conveyance be by grant or letters patent from the State or United States, the record must be made in the land office of the State or United States. The recording of a deed has the force of seisin and possession under the English law. Any estate less than a fee may be conveyed by deed with single acknowledgment, but if the estate sought to be conveyed is a fee, the husband and wife must join in the deed and acknowledge it separately. Deeds of conveyance of lands sold at judicial sale, or for taxes for several successive years and unredeemed made by the sheriff of the county, and deeds made in pursuance of a decree of court by the officer appointed for that purpose, are as effectual as if made by the grantor and his heirs, and must be executed with the same formalities and recorded within 15 days; neither is it necessary to set forth in the deed as a part of the title the proceedings which culminate in the decree of sale. Federal decisions as to the formalities necessary to the execution of a deed are apparently conflicting. This arises from the application of the principle that land or property must be governed by the law of the place in which it is situated, and the lack of uniformity of State laws upon this subject. The United States laws are applicable only to lands belonging to the United States and those located within the territories.

DEEP-SEA EXPLORATION, that branch of thalassography which investigates the depths of oceans, seas or lakes, determines the nature and distribution of the organic life there to be found, the temperature, constitution and specific gravity of the water at varying distances from the surface, the causes and characteristics of ocean currents, the geological changes in the way of gradual or rapid upheaval or subsidence caused by volcanic action and the formation of atolls and other islands.

Measurements by means of a weighted line were used by the earliest navigators. It is said that in the Middle Ages depths of 8,000 meters were attained, but the accuracy of such soundings must be questioned. Sir John Ross in 1818 brought up a considerable amount of ice-cold slime from a depth of 978 fathoms. On the strength of these measurements it was believed that the greatest depth of the ocean was to be reckoned as about 1,000 fathoms; but shortly after, Capt. Sir James Clark Ross, during a voyage to the South Seas claimed to have found between Brazil and St. Helena, on June 3, 1843, a depth of more that 4,-800 fathoms. In 1847 Captain Stanley, of the British Navy, reported soundings at 15,000 feet between the coasts of Africa and South America.

Copper wire was used instead of rope for soundings as early as 1838, but it proved to be too weak. In 1854 J. M. Brooke, of the United States Navy, invented a detaching apparatus which worked a revolution in deep-sea operations. Since then systematic attempts have been made with improved sounding apparatus and especially in connection with the laying of cables to discover the exact lay of the submarine bottom.

After the "Challenger" expedition of 1872-1876, two systems of apparatus were invented, one by W. E. Hoyle, assistant editor of the "Challenger" reports; the other by the Prince of Monaco. The latter machine goes down closed. It opens automatically at the bottom by means of a spring shutter and is again closed by a "messenger" before it begins its ascent.

No previous ship had been so well equipped for natural history research as the "Challenger" which added thousands of new specimens to zoölogy.

About the same time with the "Challenger," the German ship "Gazelle," under Baron von Schleinitz, and the United States steamship "Tuscarora" accomplished a great deal toward the exploration of the deep-sea. Other expeditions were made between 1878 and 1882 by the ship "Faraday," and by the warship "Gettysburg" in 1876, by the "Alaska" in 1878, by the "Essex" in 1877-1878, by the "Saratoga" in 1879, and by the "Wachusett" in 1879. Still more important results were obtained by the scientific men in charge of the three cruises of the United States Coast and Geodetic Survey steamer " Blake" in the Gulf of Mexico, in the Caribbean Sea, and along the Atlantic coast of the United States in 1877-1880.

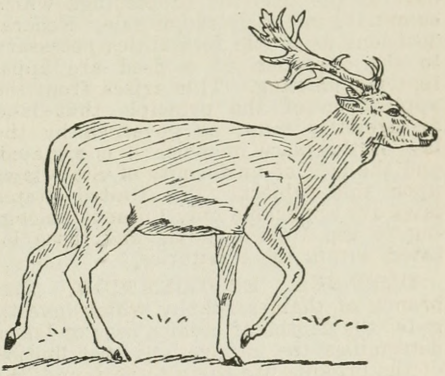
Besides these specific explorations the South Atlantic Ocean was explored by the steamship "Seine" in 1889. In the Indian Ocean the United States warships "Enterprise" and "Essex" in 1886 made explorations. The English ship "Egeria" in 1887-1889, made extensive measurements of the S. W. part of the Indian Ocean.

In August, 1899, the United States ship "Albatross" left San Francisco fully equipped with a staff of scientists, for the purpose of deep-sea exploration, examination of coral reefs, etc., in

Oceanica. The first sounding was made near the Marquesas at a depth of 1,955 fathoms. It seemed to prove that this group of islands rises from a plateau 2,000 fathoms deep and 50 miles wide. Numerous soundings were taken in the North Pacific by vessels of the United States Navy in 1900 for the purpose of developing feasible cable routes between the Hawaiian and Philippine Islands. A sounding of 5,269 fathoms, about 70 miles to the S. E. of Guam Island by the "Nero," in 1899, was taken in a locality near where the "Challenger" in 1875 took its greatest sounding (4,475 fathoms). This was surpassed by the German survey ship "Planet" in 1913, which made a sounding of 5,348 fathoms 4 miles E. of the north of Mindanao.

The best sounding-rod (as these devices are termed) of to-day is doubtless the Brooke devise as modified by Admiral Sigsbee. Sigsbee's modification may be described as follows: the sinker is an 8-inch cannon-shot weighing 60 pounds. A hole runs through it large enough to admit the sounding rod. Upon the shot are cast two ears, like the ears on a pail, to which a wire bail, like a pail-handle, is attached. The sounding-line is fastened to the ring shown near the top of the cuts. The sounding-rod is a brass tube about one-eighth of an inch thick, quite sharp on the lower edge. It operates thus: The shot is placed upon the sounding-rod. As long as the weight of the shot is borne by the sounding-line the hook will sustain the shot. But the moment that strain is relieved by the shot striking the bottom the hook doubles under and releases the wire handle of the shot. At the same time the weight of the shot buries the sharp lower edge of the sounding-rod in the bottom. This forces up a valve and a portion of the bottom enters. At the first movement toward reeling in the line the shot slips off the sounding-rod and remains behind, and the valve at the bottom of the sounding-rod closes, imprisoning a sample of the bottom. This device has been tried many hundreds of times in great depths, and it has rarely failed to detach the shot as well as bring up a liberal sample of the bottom.

DEER, a family of the ruminants distinguished chiefly by the nature of the horns or antlers, which, with the single exception of the reindeer, are borne by the males only. They are bony throughout, are annually shed and reproduced at the breeding season increasing each time in size and the number of branches till, in the old males of some species, they attain an enormous size. The antlers are carried on the frontal bone, and are produced by a process not unlike that by which injuries of osseous structures are made good in man. At first they are covered with a sensitive skin or "velvet"; but as development proceeds this skin dries up and peels off; a bony ridge or "burr" being formed on the antler just above its base of attachment to the frontal bone. When fully developed the antlers consist of a main stem or "beam," carrying one or more branches or "tynes." When first produced, in the second year after birth, the antler consists only of the "beam," the animal being then termed a "brocket." The next year a basal branch or "brow-tyne" is developed; it is then termed a "spayed"; and in the following year a second branch or "tres-tyne," directed forward, appears above the former, the hinder portion of the beam constituting the "royal." Should the antler develop further, it is by the more or less complete branching of these tynes; the "royal-tyne" in particular, being very liable to become sub-divided in successive years. The musk-deer and the water-deer of China have no horns. Deer



FALLOW DEER

are very generally distributed, but none have yet been discovered in either Australia or South Africa. The largest living form is the true elk (*Alces palmatus*) or moose, while the Indian muntjacs are among the smallest, the chevroatins being now placed in a group by themselves. Except the reindeer (*Cervus farandus*), no member of the group has been completely domesticated. In the fossil state deer are not found earlier than in the Pliocene period, while the best known extinct form, the Irish deer, or Irish elk, occurs in peat bogs or cave deposits.

DEERFIELD, a town of Franklin co., Mass.; on the Connecticut river, and the Boston and Maine and the New York, New Haven and Hartford railroads; 33

miles N. of Springfield. It is principally engaged in agriculture and the manufacture of pocket-books, and has a high school and public library. The town contains the village of South Deerfield, and was the scene of several contests with the Indians in colonial times. Among them were the "Bloody Brook Massacre" (1675) and the burning of the village by the French and Indians under De Rouville (1703). Old Deerfield has a beautiful Soldiers' Monument, and there is at South Deerfield a marble monument commemorative of the Bloody Brook disaster. Pop. (1920) 2,803.

DEERGRASS, or **MEADOW BEAUTY**, a genus of an Asiatic plant of the order *Melastomaceæ*, found chiefly in New England. It is noted for the beauty of its flowers, which have bright purple petals, and thrives best on meadow land. It is said that there are but eight species of the order in the United States.

DEERMOUSE, a small rodent belonging to the family *Muridæ*, which is found in abundance in this country. Its fur shows various brownish or grayish tints above, while the lower surface and feet, up to the wrists and ankles, are snow-white. The length of the head and body is about three inches. Its habits are nocturnal, and it feeds on corn, of which, with acorns and nuts, it lays up stores for winter use.

DEFAMATION, the act of defaming or slandering; the false and malicious uttering of slanderous words with a view to damage the character, reputation, or business of another; slander, calumny, libel. Defamation of character is actionable either by indictment or by action; but to support an action it is necessary that the plaintiff should aver some particular damage to have happened to him.

DEFAULT, a failure to appear in any court on the day assigned; especially applied to a defendant when he fails or neglects to plead or put in his answer in the time limited. In such cases the plaintiff is entitled to sign judgment against him, which is called judgment by default, and the defendant is said to suffer judgment by default.

DEFENDANT, in law, the party against whom a complaint, demand, or charge is brought; one who is summoned into court, and defends, denies, or opposes the demand or charge, and maintains his own right. The term is applied even if the party admits the claim.

DEFENDER OF THE FAITH (*Fidei Defensor*), a title belonging to the King of England, as Catholicus to the King of Spain, Christianissimus to the King of France, etc. Leo X. bestowed the title of Defender of the Faith on Henry VIII. in 1521, on account of his book against Luther, and the title has been used by the sovereigns of England ever since.

DEFENDERS, a Catholic association in Ireland (1784-1798), the opponents of the Peep o' Day Boys.

DEFIANCE, a city and county-seat of Defiance co., O.; on the Maumee river, the Wabash and the Baltimore and Ohio railroads, and the Miami and Erie canal; 50 miles S. of Toledo. It is a trade center and has woolen mills, flour mills, machine and carriage shops, 2 National banks, and daily and weekly newspapers. Pop. (1910) 7,327; (1920) 8,876.

DEFIANCE COLLEGE, a coeducational (non-sect.) institution in Defiance, O.; founded in 1884; reported at the end of 1919: Professors and instructors, 25, students, 497; president A. G. Caris.

DEFILADING, that branch of the science of fortification, the object of which is to determine, when the intended work would be commanded by eminences within range, the directions or heights of the lines of rampart or parapet, so that the interior of the work may not be incommoded by a fire directed to it from such heights.

DEFINITE PROPORTIONS, LAWS OF. See ATOMIC THEORY.

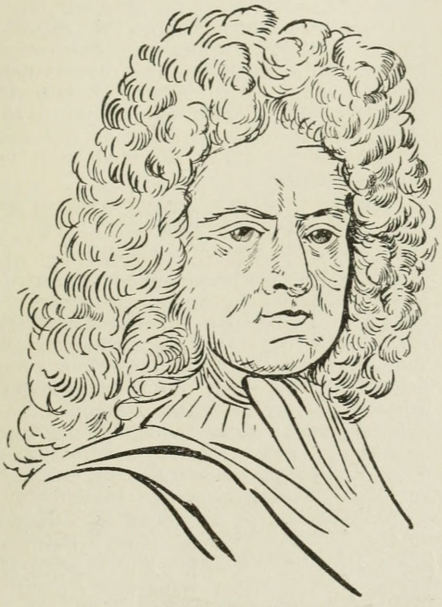
DEFINITION, the process by which we determine the common qualities of the objects belonging to any given class, so as to distinguish effectively that class from other classes. Regarding the class as a species, we give the proximate genus and the difference; genus here denoting the distinctive qualities belonging to all of the genus, while the difference marks out the part of the genus in question.

DEFLAGRATION, the term applied to the rapid combustion of ignited charcoal when a nitrate (such as nitrate of potash) or a chlorate (such as chlorate of potash) is thrown thereon. As chlorates do not occur naturally, it follows that deflagration with a natural salt indicates a nitrate; and if the deflagration be accompanied by a violent flame, it is characteristic of nitrate of potash (ordinary niter or saltpeter); and if by a strong yellow flame, it is indicative of nitrate of soda (cubical niter).

DEFLECTION, in navigation, the departure of a ship from her true course; in optics, a deviation of the rays of light toward the surface of an opaque body.

DEFLUXION, a discharge from a mucous membrane, especially of the air-passages, as in catarrh.

DEFOE, DANIEL (dē-fō), an English writer; born in London in 1661. In 1685 he joined the insurrection of the Duke of Monmouth, and had the good fortune to escape; after which he made several unsuccessful attempts at business, and at last turned his attention to literature. In 1701 appeared his satire in verse, "The Trueborn Englishman," in favor of William III. As a zealous Whig and Dissenter he was frequently in trouble. For publishing "The Shortest Way with the Dissenters" (1702), he was pilloried and imprisoned in Newgate. While in Newgate, in 1704, he began the "Review," a literary and political periodical which lasted for nine years. In 1705 he wrote a short account of the "Apparition of One Mrs. Veal," a fictitious narrative. In 1706 he published his longest poem, entitled "Jure Divino," a satire on the doctrine of divine right. In 1719 appeared the most popular of all his per-



DANIEL DEFOE

formances, "The Life and Surprising Adventures of Robinson Crusoe," the favorable reception of which was immediate and universal. The success of Defoe in this performance induced him to write a number of other lives and adventures in character, as "Moll Flanders," "Captain Singleton," "Roxana," "Duncan," "Campbell," "The Memoirs of a Cavalier," "Journal of the Plague," etc. After the accession of George I. he was employed by the government in some underhand work connected with the obnoxious Jacobite press. He died in London, April 26, 1731.

DE FOREST, LEE, an American inventor, born at Council Bluffs, Ia., 1873. He received his technical education at the Sheffield Scientific School (Yale), from which he graduated in 1896, then devoted three years to post-graduate work at Yale. He was one of the pioneers in the development of wireless telegraphy in this country. In 1919 he had taken out 120 patents on radio telegraphy and telephony, the most important one of which is the Audion, a detector and amplifier, which made transcontinental telephone service possible. In 1907 he became vice-president of the Radio Telephone Co. and of the De Forest Radio Telephone Co.

DE FOREST, ROBERT WEEKS, an American lawyer and philanthropist, born in New York City in 1848. He graduated from Yale in 1870 and from the Columbia Law School in 1872. After studying abroad he was admitted to the bar in 1871 and engaged in the practice of law, first with his father and afterward with his sons. He was a director in many financial institutions and was prominently identified with charitable work in New York City. He was president of the Metropolitan Museum of Art in 1913. In 1900 he was chairman of the New York State Tenement House Commission and in 1903 was president of the National Conference of Charities and Correction of Atlanta. He was vice-president of the American Red Cross.

DEFORMITIES, variations in the form of the body as a whole, or in one or more of its parts, constituting a departure from the normal conditions of structure, and usually implying a corresponding divergence from natural and healthy functions. They may be divided into three groups, with reference to their origin—the hereditary, the congenital, and the acquired. The first group is characterized by a marked tendency to recurrence in the line of direct descent from generation to generation, as in those cases where the presence of extra fingers or toes has become characteristic of many members of one family.

The chief varieties of malformation, coming under the heading of congenital deformities, are the following: (1) As regards the number of parts. In the Siren, two lower extremities are fused into one mass, but dissection shows that all the constituent bones of the limb may be present, though much distorted, in the combined structure. In the Cyclops, the eyes are similarly fused into one irregular structure occupying the center of the face. (2) As regards the size of parts.

This may involve the whole body, as in dwarfs, of whom there have been some remarkable peripatetic specimens: the Corsican fairy was only 2 feet 7½ inches high. Deformities the opposite of this exist, such as giants, or instances of premature or excessive local growth. O'Byrne, the Irish giant, measured 8 feet 4 inches when he died at the age of 22. Such individuals are generally subject to premature decay. (3) As regards the shape and continuity of parts. Distortion may occur from partial paralysis or irregular muscular action at an early stage of development, giving rise to club-foot, club-hand, etc.; or natural fissures or apertures which should close in the course of development may remain open, as in harelip, cleft palate, and spina bifida.

Acquired deformities arise in various ways as the result of injury or disease at any period after birth. Another group of these affections, known as "trade" deformities, are directly traceable to the special work done by the person suffering from them. See DARWINIAN THEORY.

DEFREGGER, FRANZ (def-reg'er), a German genre painter of deserved popularity; born in Stronach, in 1835. The subjects of almost all his pictures are drawn from the Tyrolese peasant life, his few religious pictures having been in the main unsuccessful.

DEGENERATION, a biological term used to describe those not unfrequent cases where an entire organism falls below the structural level of its young stages, or where an organ in the same way loses its fullness of function, and becomes more or less atrophied, abortive, and simplified. Thus many parasitic worms, crustaceans, etc., are emphatically simpler than their free-swimming larvæ, and the sensile adult Ascidian shows only traces of the vertebrate characters which are plain enough in the active young. Thus, too, a crustacean which starts with a well-developed eye, may exhibit the gradual loss of this on assuming a dark habitat. The term is best confined to cases where a level of structure exhibited during early life is more or less lost in the adult. Degeneration must be distinguished (*a*) from occasional abortion, (*b*) from reversion to an ancestral type, and (*c*) from the occurrence of rudimentary and undeveloped organs where a character possessed by ancestral types remains more or less undeveloped, or shows itself only in embryonic life. Degeneration may be due to the environment, or to cessation of function, or to some more subtle constitutional cause. The theory of the degeneration of man from a high state has been superseded by the belief in a development from low savagery.

DEGGENDORF (deg'en-dorf), a town of lower Bavaria, on the Danube, which is here crossed by two bridges, 39 miles N. W. of Passau, with manufactures of paper, linen, woolens, stoneware, and matches. Its church of the Holy Sepulcher is often visited by more than 30,000 pilgrims annually. Pop. (1905) 7,211.

DE GIOSA, NICOLA (de-jē-ō'sa), an Italian musician; born in Bari, May 5, 1820. His opera, "Don Checco," is very popular in Italy. His 400 songs were widely sung. He died in Bari, July 7, 1885.

DE GOGORZA, EMILIO EDOUARDO, an American singer, born in Brooklyn, N. Y., in 1874. He was educated in Paris and in England. His musical career was begun as a boy soprano in England and in 1897 he appeared in New York City with Mme. Sembrich's Company at the Metropolitan Opera House. He appeared as a soloist with leading orchestras and at musical festivals, and made many tours throughout the United States as a concert singer. He married in 1911 Mme. Emma Eames, the operatic soprano.

DEGRADED, furnished with steps; an epithet in blazoning for a cross that has steps at each end, diminishing as they ascend toward the center.

DEGREE, the 360th part of the circumference of a circle. A degree of latitude is the length along a meridian, such that the difference of latitude between its N. and S. ends is one degree—*i. e.*, from the two positions the altitude of the same star is seen to differ by one degree. Another definition is that two points on the earth's surface differ in latitude by one degree, when the verticals at these points make angles with the plane of the equator, differing by one degree. Were the earth perfectly spherical in shape, this distance along a meridian would be exactly equal to 1-360 of the whole meridian, and would be the same at all parts of the earth's surface; but owing to its oblately spheroidal shape it increases from the equator, where the curvature is greater, to the poles, where it is less curved. From geodetical measurements made, it is found that at the equator the length of a degree of latitude is 362,746.4 feet; while at the poles it is 366,479.8 feet. The differences between the length of the degree of latitude in different latitudes, thus ascertained by actual measurement, is one of the proofs that the figure of the earth is not that of a sphere but that of an oblate ellipsoid.

A degree of longitude is the length between two meridians that make an angle of one degree at the poles, measured by the arc of a circle parallel to the equator passing between them. It is clear that this space is greatest at the equator, and vanishes at the poles; and it can be shown that it varies with the cosine of the angle of latitude. The annexed table shows the lengths of a degree of longitude for places at every degree of latitude from 0° to 90°. It is computed on the supposition that the earth is a sphere.

Deg. lat.	Eng. miles.	Deg. lat.	Eng. miles.	Deg. lat.	Eng. miles.
0	69.07	31	59.13	61	33.45
1	69.06	32	58.51	62	32.40
2	69.03	33	57.87	63	31.33
3	68.97	34	57.20	64	30.24
4	68.90	35	56.51	65	29.15
5	68.81	36	55.81	66	28.06
6	68.62	37	55.10	67	26.96
7	68.48	38	54.37	68	25.85
8	68.31	39	53.62	69	24.73
9	68.15	40	52.85	70	23.60
10	67.95	41	52.07	71	22.47
11	67.73	42	51.27	72	21.32
12	67.48	43	50.46	73	20.17
13	67.21	44	49.63	74	19.02
14	66.95	45	48.78	75	17.86
15	66.65	46	47.93	76	16.70
16	66.31	47	47.06	77	15.52
17	65.98	48	46.16	78	14.35
18	65.62	49	45.26	79	13.17
19	65.24	50	44.35	80	11.98
20	64.84	51	43.42	81	10.79
21	64.42	52	42.48	82	9.59
22	63.97	53	41.53	83	8.41
23	63.51	54	40.56	84	7.21
24	63.03	55	39.58	85	6.00
25	62.53	56	38.58	86	4.81
26	62.02	57	37.58	87	3.61
27	61.48	58	36.57	88	2.41
28	60.93	59	35.54	89	1.21
29	60.35	60	34.50	90	0.00
30	59.75				

DEGREE, in music, a step in the tone-ladder. It may consist of a semi-tone, a tone, or (in the minor scale) of an augmented tone. When the notes are on the same line or space they are in the same degree. The interval of a second is one degree, the interval of a third two degrees, and so on, irrespective of the steps being tones or semi-tones. Hence, also, notes are in the same degree when they are natural, flat, or sharp, of the same note, as C and C sharp, E and E flat; and they are in different degrees when, though the same note on an instrument of fixed intonation, they are called by different names, as F sharp and G flat, C sharp and D flat.

DEGREE, in universities, a mark of distinction conferred on students, members, or distinguished strangers, as a testimony of their proficiency in the arts or sciences, or as a mark of respect, the former known as ordinary, the latter as honorary degrees. The degrees are bachelor, master, and doctor, and are conferred in arts, science, medicine, divinity, and music.

DEGREE, in algebra, a term used in speaking of equations, to express what is the highest power of the unknown quantity. Thus if the index of that power be 3 or 4 (x^3, y^4), the equation is respectively of the third or fourth degree.

DEHISCENCE, a gaping, an opening, a yawning. The opening of capsules and of the cells of anthers for the discharge of their contents. This takes place either by clefts, by hinges, or by pores. When the anther-lobes are erect, the cleft takes place lengthwise along the line of the suture, constituting longitudinal dehiscence. At other times the slit takes place in a horizontal manner, from the connective to the side, as in *Alchemilla arvensis* and in *Lemna*, where the dehiscence is transverse. When the dehiscence takes place by the ventral and dorsal sutures, as in the legume of the pea and bean, it is called sutural. When composed of several united carpels, the valves may separate through the dissepiments, so that the fruit will be resolved into its original carpels, as rhododendron, colchicum, etc. This dehiscence, in consequence of taking place through the lamellæ of the septum, is called septicidal. Loculicidal dehiscence is where the union between the edges of the carpels is persistent, and they dehisce by the dorsal suture, or through the back of the loculaments, as in the lily and iris. Sometimes the fruit opens by the dorsal suture, and at the same time the valves or walls of the ovaries separate from the septa, leaving them attached to the center, as in datura. This is called septifragal dehiscence, and may be looked upon as a modification of the loculicidal.

DEHRA DOON (dā'ra), a beautiful and fertile valley in the Meerut division of the Northwestern Provinces, Hindustan, at the S. W. base of the lowest and outermost ridge of the Himalaya. It is bounded on the N. by the Jumna, N. E. by the mountains of Gurwhal, from 7,000 to 8,000 feet high, S. E. by the Ganges, S. W. by the Sewalik range, 3,000 to 3,500 feet high. Its length from S. E. to N. W. is about 45 miles; breadth, from 15 to 20 miles. The chief town in the valley is Dehra.

DEIAMBA, Congo tobacco, a plant growing wild in the marshy districts of Congo, the flowers of which produce a narcotic effect when smoked.

DEICIDE, the putting to death of God in the person of our Lord; also one concerned in putting our Lord to death.

DEIDAMIA (de-dām'ya), daughter of Lycomedes, King of Scyros. She was the mother of Neoptolemos by Achilles, according to the legend.

DEISM, the doctrines or tenets of a deist; the system of belief which admits the being of a God, and acknowledges several of His perfections, but denies not only the existence but the necessity of a divine revelation.

DEIST, one who admits the being of a God, but denies the existence or even necessity of a divine revelation, believing that the light of nature and reason are sufficient guides in doctrine and practice; a believer in natural religion only; a freethinker.

DEISTIC, or **DEISTICAL**, pertaining to deism or the deists; containing the doctrines of deism.

Also a term applied to a controversy which arose in England in the 17th and 18th centuries, between those who believed and those who disbelieved in revelation; the latter, however, not occupying the atheistic standpoint, but accepting as a settled point the being of a God. The first, in point of time, of the celebrated English deists was Lord Herbert of Cherbury, the publication of whose work, "De Veritate" (1624), began the controversy. There followed, on the same side, Hobbes, Tindal, Morgan, Toland, Bolingbroke, Paine, and others.

DE KALB, a city of Illinois in De Kalb co. It is on the Chicago, Aurora and De Kalb, the Chicago Great Western, and the Chicago, Milwaukee and Gary railroads. The city has manufactures of barbed wire, agricultural implements, pianos, shoes, etc. It is the seat of the Northern Illinois State Normal School. Pop. (1910) 8,102; (1920) 7,871.

DE KALB, JOHN, BARON, a French officer; born in Bavaria, about 1732. He accompanied Lafayette to America in 1777; was appointed the same year Major-General in the American army; and joined the main force under Washington. In the battle of Camden, Aug. 16, 1780, he was at the head of the Maryland and Delaware troops, who maintained their ground till Cornwallis concentrated his whole force upon them. He fell, pierced with 11 wounds, in the charge upon his regiment before they gave way. He died three days after at Camden, where a monument, of which Lafayette placed the corner-stone, was erected to his memory in 1825.

DE KAY, CHARLES, an American poet, grandson of Joseph Rodman Drake; born in Washington, D. C., July 25, 1848. His poems are mostly founded on themes from Oriental, classical, and literary history. Among his works are: "Hesperus and Other Poems" (1880); "The Vision of Nimrod" (1881); "The Vision of Esther" (1882); "The Love Poems of Louis Barnavai, Edited (and written) by Charles De Kay" (1883). His prose includes: "Life and Works of Antoine Louis Barye, Sculptor" (1889); and "The Family Life of Heinrich Heine" (1892), a translation. He was literary and art editor of New York "Times," 1876-1906; art editor "Evening Post," 1907. From 1915 he was associate editor of the "American Art World." He was a member of the American Institute of Arts and Letters.

DEKKER, THOMAS, an English dramatist; born in London, about 1570; died some time after 1637. He wrote a great number of plays, but only a few of them were published, among them the two comedies, "The Shoemaker's Holiday," and "Old Fortunatus"; they are both specimens of whatever is best and most genuine in English humor, and the second in particular abounds in passages of consummate poetic beauty. Of other writings of his we have "The Wonderful Year," a pamphlet describing graphically the horrors of the plague; an amusing tract, "The Bachelor's Banquet," a satire on henpecked husbands; and many other fugitive pieces lashing the vices and follies of the age. He also collaborated with other dramatists.

DE KOVEN (HENRY LOUIS) REGINALD, an American composer born in Middletown, Conn., April 3, 1859. He was graduated at Oxford in 1879 and studied music in the leading cities of Europe. His operettas have had great success, notably "The Begum," "Don Quixote," "Robin Hood," "The Fencing Master," "The Three Dragoons," "Maid Marian," "Student King," etc. He composed some popular songs, as "Oh, Promise Me," and "Recessional." Died 1915.

DELACROIX, EUGÈNE (-krwä'), a French painter, chief of the romantic school; born near Paris, April 26, 1799. At the age of 18 he entered the atelier of Pierre Guérin, and came under the influence of his fellow-pupil, Géricault. In 1822 he exhibited his first work, "Dante and Vergil," the novel force of which attracted much attention. In 1824, Delacroix, now at the head of the new school of young painters, produced the "Massacre of Scio," which was entirely repainted after the artist had studied a work of Constable's. The July revolution left its impress on Delacroix, and in 1831 appeared his "Liberty Directing the People on the Barricades." In 1832 he made a

voyage to Morocco. From this period. Delacroix continued to send forth picture after picture, besides decorating many public buildings and churches. He also executed a number of lithographs, including a series illustrating "Hamlet," and one dealing with "Faust". In 1857 he was chosen by the Institute to fill the place of Delaroche. He died Aug. 13, 1863.

DELAGOA BAY (del-a-gō'ä), in southeast Africa, a large sheet of water separated from the Indian Ocean by the peninsula and island of Inyack. The bay stretches N. and S. upward of 40 miles, with a breadth of from 16 to 20 miles, and forms the southern extremity of the Portuguese settlement of Mozambique. It is available for vessels of large tonnage, though the presence of shoals, banks, and flats, renders the navigation of the bay somewhat intricate. The Olifants or Krokodil river, flowing into it, is navigable for steam launches for a considerable distance; but there are swamps around the coast, and some malarial fever is prevalent. The Transvaal border begins 52 miles inland. In the course of the negotiations between Great Britain and Portugal as to the action of the latter power in East Africa, the claims of the Delagoa Bay Railway Company for compensation for the seizure of the line by Portugal on June 29, 1889, were brought foward. This was decided against Portugal (as announced March 29, 1900), damages of over $3,100,000 being awarded with interest from 1889. In September, 1900, a compromise of these claims was finally agreed to, the American claimants getting an aggregate of $500,000, out of which they were ordered to pay the costs of the United States Government. The extension of the line from the Portuguese frontier at Komati (which is 60 miles from the port of Lorenzo Marques) to Pretoria (Transvaal) was formally opened on July 8, 1895. The extension is the property of the Netherlands South African Railway Company, and places Pretoria by rail 350 miles from the coast, and Johannesburg 400 miles. The distance from the latter city to Cape Town by rail is 1,013 miles.

DELAND, ELLEN DOUGLAS, an American author, born in Lake Mahopac, N. Y., in 1860. She was educated privately. Her writings include many novels, among them "A Successful Venture"; "Alan Ransford"; "Miss Betty of New York"; "The Waring Girls" (1917); "Clyde Corners" (1918).

DELAND, MARGARETTA WADE (CAMPBELL) (de-land'), an American poet and novelist; born in Allegheny, Pa., Feb. 23, 1857. Her most famous books are "John Ward, Preacher" and "Dr. Lavendar's People." Among her other well-known works are: "The Story of a Child," "Mr. Tommy Dove and Other Stories," "Philip and His Wife," "Florida Days," a collection of sketches of travel; "Sydney." "The Awakening of Helena Richie" (1906); "The Iron Woman"



MARGARETTA DELAND

(1911); "Hands of Esau" (1914); "Around Old Chester" (1915). Her most popular poems are contained in the volume entitled "The Old Garden and Other Verses."

DELANE, JOHN THADDEUS, an English journalist; born in London, Oct. 11, 1817. He was graduated at Oxford in 1839, and became editor of the "Times" in 1841, retaining that post till 1877, during which time that paper attained an almost unparalleled influence and a great circulation. He died Nov. 22, 1879.

DELANO, FREDERIC ADRIAN, an American financier and public official, born at Hong Kong, China, in 1863. He graduated from Harvard in 1885 and began his business career with the Chicago, Burlington and Quincy railroad. He served in various capacities in the same company and was appointed general manager in 1901. In 1905 he left this service

to become consulting engineer to the War Department in relation to railroads in the Philippine Islands. He was afterward president and director of many important railroad systems. In 1913 he was appointed by President Taft, and again by President Wilson in 1914, as a member of the Federal Reserve Board and was designated vice-governor for two years. He resigned to enter the army in June, 1918. As a major and lieutenant-colonel he performed service in the Engineering Corps, and as deputy director of transportation in France. He was promoted to be colonel of the Transport Corps in 1919 and was honorably discharged in October of that year. He was a member of many scientific societies.

DE LA RAMÉE, LOUISE. See OUIDA.

DELAROCHE, HIPPOLYTE (familiarly styled Paul), (de-lä-rōsh), a French painter; born in Paris, July 16, 1797. He studied landscape painting for a short time but applied himself afterward to historical painting, and rapidly rose to eminence. Notable among his works are: "St. Vincent de Paul preaching before Louis XIII. on behalf of Deserted Children," "Joan of Arc Interrogated in Prison by Cardinal Beaufort," the "Death of Queen Elizabeth," "The Children of Edward IV. in the Tower," "Cardinal Richelieu Conducting Cinq Mars and De Thou up the Rhone to Execution," "Charles I. Mocked by His Guards," the "Execution of Lady Jane Grey," the "Death of the Duke of Guise," and the "Hemicycle," an immense work painted in oil on the wall of The École des Beaux Arts, Paris. It represents an assemblage of the great painters, sculptors, and architects from the days of Giotto to those of Lesueur. He held a middle place between the classical and the romantic schools, and was regarded as the leader of the so-called "eclectic school." He died in Paris, Nov. 4, 1856.

DELAVIGNE, JEAN FRANCOIS CASIMIR (de-lä-vēn′), a French poet and dramatist; born in Havre, April 4, 1793. He produced in 1819 his tragedy of "The Sicilian Vespers"; "The Comedians" appeared in 1820, and the tragedy of "The Paria" in 1821. Of his other plays which followed these may be mentioned: "The School of Old Men"; "Marino Faliero"; and the dramas of Louis VI.—founded on Commines' "Memoirs" and "Quentin Durward"—and "Don John of Austria." His hymns, "The Parisienne" and "The Varsovienne," and the ballad "The Toilette of Constance," are among his more popular poetical pieces. He became in 1825 a member of the Academy. He died at Lyons, France, Dec. 11, 1843.

DELAWARE, a State in the South Atlantic Division of the North American Union; bounded by Pennsylvania, Delaware river and bay, the Atlantic Ocean, and Maryland; area, 2,050 square miles; one of the original 13 States; number of counties, 3; pop. (1890) 168,493; (1900) 184,735; (1910) 202,322; (1920) 223,003; capital, Dover.

Topography.—Delaware lies on a level plain, the highest elevation being less than 300 feet above the sea. The N. part is hilly, with a rolling surface, but below Newcastle the ground is flat and sandy and in some parts swampy. A ridge about 70 feet in altitude extends along the W. boundary of the State and is the watershed for the affluents of the Delaware in the E. and of several streams falling into Chesapeake Bay. The principal streams are the Christiana and the Brandywine rivers. The Christiana is navigable for large steamers as far as Wilmington. The coast of Delaware Bay is marshy; the Atlantic coast has many sand beaches, inclosing shallow lagoons. The largest of these are Rehoboth Bay, Indian River Bay, and a portion of St. Martin's Bay. The only harbors of consequence are Wilmington, Lewes, and Newcastle.

Mineralogy and Geology.—Geologically, the State is divided into three divisions, the cretaceous in the N.; tertiary in the Central, and post-tertiary or alluvial in the S. Bog iron ore, found in all the swamps, shell marl in the greensand region, and kaolin or porcelain clay, are abundant.

Soil.—For eight or ten miles inland from Delaware Bay the soil is for the most part a rich clayey loom; but W. of this it is light and sandy, and productive when well fertilized. The swamps where reclaimed are also very productive. In them are extensive forests of cypresses and other evergreen trees, and shrubs of a semi-tropical character, as well as bog-oak, hackmatack, etc. The remainder of the State has been cleared of its forests and is under cultivation.

Agriculture.—The State is highly agricultural, ten-thirteenths of its entire area being under cultivation. It is pre-eminently a fruit-growing region, peaches, apples, pears, quinces and other small fruits are extensively raised, and the annual peach crop alone averages 4,000,000 baskets. The acreage, production, and value of the principal crops in 1919 was as follows: corn, 230,000 acres, production 6,900,000 bushels, valued at $10,005,000; wheat, 145,000 acres, production 1,740,000 bushels, valued at $3,706,000; potatoes, 11,000 acres, production 915,000 bushels, valued at $1,141,000; sweet potatoes, 7,000 acres, production 966,000

bushels, valued at $1,063,000; hay, 82,000 acres, production 105,000 tons, valued at $2,730,000.

Manufactures. — Delaware has extensive manufactures. In 1914 there were 808 manufacturing establishments in the State. The average number of wage earners was 22,105, and the capital invested amounted to $69,320,000. There was paid in wages $11,382,000. The value of the materials used was $31,649,000, with the finished product valued at $56,035,000.

Banking.—In 1919 there were 19 National banks in operation, having $1,429,000 capital, $885,256 in outstanding circulation, and $1,327,750 in reserve. There were also 5 State banks, with $620,000 capital, $8,833,000 in deposits and $10,847,000 in resources.

Education.—The total enrolment in the public schools in 1919 was 37,440, with an average enrolment of 30,024, and an average attendance of 28,216. There were about 1,120 teachers employed, receiving an average annual salary of $662.10. The educational conditions in the State have for many years been unsatisfactory, but in 1919 there was passed and approved an elaborate school code providing for county and district administrative machinery, and making radical reforms and changes in the conduct of the schools. This code resulted from a study of a school survey commission appointed in 1917.

Churches.—The strongest denominations numerically in the State are the Methodist Episcopal, Roman Catholic, Protestant Episcopal, Lutheran, Baptist, and Presbyterian.

Railways.—The roads having the longest mileage in the State are the Wilmington, Philadelphia Traction Company, the Wilmington, Newcastle, and Delaware City, and the People's Railway Company. The total railway mileage operated in or through the State is about 350 miles.

Finance.—The receipts for the fiscal year 1918 amounted to $1,428,848, and the expenditure to $1,311,404. There was a balance at the end of the fiscal year of $571,195. The State had an outstanding indebtedness in 1919 of $1,581,785.

State Government.—The governor is elected for a term of four years. Legislative sessions are held biennially. The Legislature has 35 members in the House and 17 in the Senate, members of the House are elected for a term of two years, and members of the Senate for four years, each receiving a salary of $5 per day for 60 days. Delaware sends one Representative to Congress.

Charities and Corrections.—The charitable and correctional institutions of the State include the State Hospital for the Insane at Farnhurst, Delaware Hospital at Wilmington, Physicians' and Surgeons' Hospital at Wilmington, Hope Farm Sanitarium at Marshallton, State Penitentiary at Wilmington, Ferris Industrial School at Marshallton, and the Industrial Schools for Girls at Wilmington.

History.—Delaware was named after Lord Delaware, governor of Virginia, who sailed up the bay in 1610. The first settlement was made by the Dutch in 1631, and in 1638 a colony of Swedes and Finns built a fort on Christiana creek and called the country New Sweden. There was constant friction between the Dutch and Swedes until 1664, when all the Dutch settlements came under English rule. For over 20 years Delaware was part of Pennsylvania, known as the "three lower counties on the Delaware." The State became independent during the Revolution, and her soldiers, known as the "Blue Hen's Chickens," did admirable service during the war. Delaware was the first State to ratify the Federal Constitution, Dec. 7, 1787. Although a slaveholding State, Delaware did not secede in 1861, but strongly supported the Union cause and furnished nearly 14,000 troops.

DELAWARE, a city and county-seat of Delaware co., O.; on the Olentangy river, and the "Big Four," Pennsylvania Company and several other railroads; 24 miles N. of Columbus. It is the trade center of Delaware and surrounding counties, and has manufactures of iron, flour, woolen, lumber, furniture, agricultural implements, etc. It is the seat of Ohio Wesleyan University. There are sulphur, magnesia, and other mineral springs near by, and the city has large railroad repair shops, hotels, daily and weekly newspapers and 2 National banks. Pop. (1920) 9,076; (1920) 8,756.

DELAWARE, a river of the United States which rises in the Catskill Mountains in New York; separates Pennsylvania from New York and New Jersey, and New Jersey from Delaware; and empties into Delaware Bay. It has a course of about 300 miles, and is navigable for large vessels to Philadelphia, and for smaller craft to the head of tidewater at Trenton (155 miles).

DELAWARE BAY, an estuary or arm of the sea between the States of Delaware and New Jersey. At the entrance, near Cape Henlopen, is situated the Delaware Breakwater, which affords vessels a shelter within the cape. It was erected by the Federal government, and cost about $3,000,000.

DELAWARE COLLEGE, an institution for higher education at Newark, Del., founded in 1833. In 1919 there were in attendance 296 students. The faculty numbered 52. President, S. C. Mitchell, Ph. D.

DELAWARE INDIANS. See LENAPES.

DELAWARE, or DELAWARR, THOMAS WEST, an American colonial governor, born in England. He succeeded his father as third Lord Delaware in 1602 and some years later was appointed governor of Virginia. He arrived at his post in June, 1610, but was prostrated by sickness the following year. He died at sea, June 7, 1618.

DELBRÜCK, MARTIN FRIEDRICH RUDOLF VON, a Prussian statesman, born in 1817. After serving for 15 years with the Prussian Bureau of Commerce, he became, in 1859, Director of the Department of Commerce and Industry, in which capacity he consolidated German industry and negotiated important treaties with France, England, Belgium, and other countries. In 1867 he was appointed president of the Chancery of the North-German Confederation, and in the following year was appointed a Prussian minister of state. He was strongly under the influence of Bismarck and was in reality a representative of that statesman. He carried out several important missions to foreign courts. He had much to do with the conclusion of the treaties of Versailles in November, 1870. Until 1876 he was President of the Imperial Chancellery, when he came in conflict with Bismarck over the policy of state railway ownership. In 1881 he retired to private life and died in 1903.

DELEB PALM, the *Borassus Æthiŏpum*, a native of the interior and W. of Africa, allied to he Palmyra palm. Its leaves and fruits are used by the Africans for the same purposes as those of the Palmyra by the Asiatics, and the tender roots produced by the young plant are extensively used as an article of food.

DELEGATE, a person appointed and sent by another or by others, with powers to transact business as his or their representative. The title was given to members of the first Continental Congress in America, 1774. Representatives from United States territories are so designated.

DELENDA, things to be erased or expunged. *Delenda est Carthago* is the celebrated sentence with which Cato the elder was accustomed to conclude all his speeches in the Roman Senate. His hatred of Carthage arose from a jealousy of its flourishing state, and the consequent danger to Rome, and eventually led to its destruction in 146 B. C.

DELESSERIA (named after M. Benjamin Delessert, a French patron of botany), a genus of florideous algæ, the typical one of the sub-order *Delesserieæ*. The species have a flat membranaceous rose-colored frond. The one best known is *D. sanguinea*. Its fruit ripens in winter.

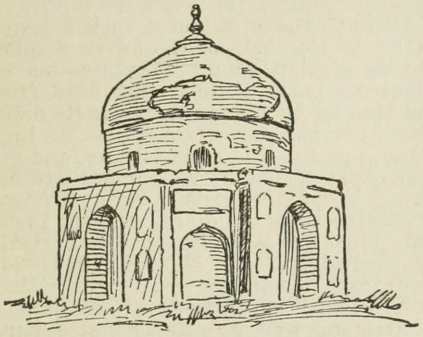
DELESSERIEÆ, a sub-order of algæ, order *Ceramiaceæ* (rose-tangles). The frond is cellular, the coccidia inclosing closely-packed oblong granules arising from the base, within a spherical cellular envelope which finally bursts; tetraspores in definite heaps or collected in sporophylls.

DELFT, one of the most ancient towns of South Holland, on the Schie, 8 miles N. W. of Rotterdam; is intersected by numerous canals. Delft was noted from the 16th to the 18th century for its delftware, but has now entirely lost its high reputation for this manufacture, and not more than a few dozen persons are engaged in making earthenware. Of several interesting buildings, one, the townhall (1618) is a picturesque and richly adorned edifice. The New Church (1476) contains a monument, more ornate than tasteful, to the memory of William I. of Orange, who was assassinated here, July 10, 1584. It also contains the tomb of Grotius, and the burial-vaults of the present royal family of Holland. The Old Church, a building of some note, contains the tomb of the naturalist, Leeuwenhoek, and of the great admiral, Van Tromp. Delft has also a State arsenal, an East Indian college, a polytechnic, and several hospitals. There are some manufactures of fine carpets, casks, baskets. Pop. about 35,000.

DELFTWARE, a kind of pottery originally manufactured at Delft, in Holland, in the 14th century. It was among the best of its day, being considered equal to the Italian in quality, but somewhat inferior in its ornamentation.

DELHI (del'i), a city of Hindustan, in the Punjab, anciently capital of the Patan and Mogul Empires, about 954 miles N. W. of Calcutta. It was at one time the largest city in Hindustan, covering a space of 20 square miles, and having a population of 2,000,000. A vast tract covered with the ruins of palaces, pavilions, baths, gardens, mausoleums, etc., marks the extent of the ancient metropolis. The present city abuts on the right bank of the Jumna, and is surrounded on three sides by a lofty

stone wall 5½ miles long, strengthened by the British at the beginning of the 19th century with a ditch and glacis. The palace or residence of the Great Mogul, built by Shah Jehan, begun in 1631, and now known as "the fort," is situated in the E. of the city, and abuts directly on the river. It is surrounded on three sides by an embattled wall of reddish sandstone nearly 60 feet high, with round towers at intervals, and a gateway on the W. and S. Since the mutiny in 1857, a great portion has been demolished in order to make room for military barracks. One of the most remarkable objects in the city is the Jamma Musjid or Great Mosque, a magnificent structure in the Byzantine-Arabic style, built by the Emperor Shah



TOMB OF THE BANGLE-MAKER
DELHI, INDIA

Jehan in the 17th century. Among modern buildings are the government college, founded in 1792 (abolished as a college); the Residency, and a Protestant church. The East Indian Railway enters the city by a bridge over the Jumna. The S. W. quarter of the town is densely occupied by the shops and dwellings of the native population; the streets are narrow and tortuous, but some of the main thoroughfares of the city are splendid streets, the chief being the Chandni Chauk, or "Silver Street." During the mutiny Delhi was seized by the Sepoys, who held possession for four months, during which many atrocities were committed. Pop. about 235,000.

DELIBES, LEON (de-lēb), a French composer; born in St. Germain du Val, Feb. 21, 1836; entered the Paris Conservatoire in 1848, and in 1855 produced an operetta, "Two Bags of Charcoal." At the Grand Opera, his music for the ballet "The Fountain" (1866) met with great success. The ballet-music for "Coppélia" (1870), is his finest work. He wrote music for a third ballet and for three comic operas. "The King Said So" (1873), became very popular. In 1880 he was appointed professor in the Conservatoire. He died Jan. 16, 1891.

DELILAH, a woman of the Philistines, beloved of Samson. She persuaded him to reveal to her the secret of his great strength, and when she learned that it lay in his long and thick hair, cut off his locks while he was asleep and then treacherously delivered the helpless man into the hands of his enemies.

DELIQUESCENCE, the property which certain very soluble salts and other bodies possess of absorbing moisture from the atmosphere. This property is made use of in drying salts, etc., the substance being placed over another substance which absorbs water from the air, as sulphuric acid, chloride of calcium, quicklime, etc., in an air-tight vessel called a desiccator.

DELIRIUM, increased ideation ranging from simple confusion of thought to fixed delusion, accompanied by incoherence, restlessness, and frequently combined with some amount of unconsciousness, deepening at times into coma. It often occurs in the course of general specific diseases, in pneumonia, erysipelas, gout, acute mania, alcoholic poisoning as delirium tremens, and as a consequence of nervous exhaustion from mental overwork.

DE LISLE. See LECONTE DE LISLE.

DELIVERY, in law (1) the delivery of a deed, or the handing of it over to the grantee, which is expressed in the attestation, "sealed and delivered," is one of the requisites to a good deed. A deed takes effect only from this delivery; for if the date be false or impossible, the delivery ascertains the time of it. A delivery may be either absolute, that is, to the grantee himself or to a third person to hold till some conditions be performed on the part of the grantee. In certain cases as wills, bonds made by a parent in favor of his children, or deeds in which the grantee has himself an interest, or where there is a mutual obligation between the parties, delivery is not required. See DEED.

(2) An expression peculiar to England, also called jail delivery, a term applied to the Sessions at the Old Bailey, London, or the Assizes, when the jail is delivered or cleared of the prisoners.

DELLA CRUSCANS, a coterie of English poetasters resident for some time in Florence, who printed inferior sentimental poetry and prose in 1785. Removing to England, their work was published chiefly in the "World" and "Oracle." Mrs. Piozzi, Boswell, Merry, Cobb Holcroft, Mrs. H. Cowley, and Mrs.

Robinson, were the leaders. They took the name from the Accademia Della Crusca in Florence.

DELLA ROBBIA, LUCA, an Italian sculptor; born in 1400, in Florence, died in 1482. He was distinguished for his work both in marble and bronze, and also for his reliefs in terra-cotta coated with enamel, a kind of work named after him. Other members of the family, distinguished themselves in the same line, especially ANDREA (1435-1525), nephew and pupil of Luca.

DELORME, MARION, a famous French woman; born Oct. 31, 1613, in or near the town of Blois. She went early in life to Paris, where her great beauty and brilliant wit soon gathered a group of wealthy and high-born lovers round her. Cardinal Richelieu revenged himself for her contempt by causing her to be separated from the ill-fated young Cinq-Mars, her love for whom was the one ennobling passion of her life. Among her lovers were, in succession, the Duke of Buckingham, Saint-Evremond, the Duc de Brissac, the Chevalier de Grammont, and Emery, the Superintendent of Finance. During the first disturbances of the Frondeurs, her house was the rallying-point of the chiefs of that party, and in consequence Mazarin was about to fling her into prison, when she suddenly died in 1650.

DELOS, CYNTHUS, or ORTYGIA (now called SAILLES, SAYLLI, DELO, or DELI), is the smallest of the Cyclades, at the N. of Naxos, and was famous throughout antiquity as having been the birthplace of Apollo and Diana. According to the legend it was a floating island, but was rendered immovable in order that Latona might give birth in security to these two divinities. It was consecrated to the worship of Apollo and peopled by Ionians; and, in Homer's time, was the central seat of their political and religious union. Like all ancient temples of celebrity, that of Apollo at Delos was one of the great emporia for trade; and, after the fall of Corinth, the Delians, by wisely declaring their port free, secured that vast commerce between the East and West of which that noble city had been the channel. Its commercial importance was further insured by the peculiar sanctity which attached to the island. Even hostile fleets rode quietly at anchor in its sacred harbor. The altar in the temple of Apollo is said to have been a perfect cube, and the doubling of it was a noted mathematical problem with the ancients, which went under the name of the problema Deliacum. The decline of Delos dates from the Mithridatic War, when it was laid waste by one of the generals of Mithridates.

DELPHI, or DELPHOS (now CASTRI), a small town of ancient Phocis, in a valley to the W. of Mount Parnassus, was the seat of the most famous of all the oracles of Apollo. At this place certain exhalations, issuing from a cavern, threw all who approached it into convulsions. The responses were delivered by a priestess, called Pythia, who sat upon a tripod placed over the mouth of this cavern, and after having inhaled the vapor, gave utterance to the wished-for predictions, which were then interpreted by the priests. From its favorable position this oracle came to be consulted, not only by the Greeks, but even by the neighboring nations. The oracle continued to utter its responses long after the seat of empire had been transferred from Greece to Rome; and it was only when Constantine the Great removed the sacred tripods to adorn the hippodrome to his new city that the responses ceased to be delivered.

DELPHIN CLASSICS, a collection of the Latin classic authors made for the dauphin (Lat. *ad usum Delphini*), son of Louis XIV., under the editorship of Bossuet and Huet, with notes and interpretations. A similar series based on these was published in London.

DELPHINIDÆ, one of the families into which the order *Cetacea* is divided. It comprises such forms as the true dolphins, the fresh-water dolphins of the Ganges and Amazon, the porpoises, the beluga, the orca, and, according to some authors, the narwhal. The members of this group possess considerable diversity in outward form, in skeletal characters, and dentition; and, with the exception of the narwhal they agree in having numerous conical teeth in both jaws. The *delphinidæ* are found fossil in deposits of Miocene and later date.

DELPHINIUM, or LARKSPURS, a genus of plants belonging to the natural order *Ranunculaceæ*. They are widely spread over the northern temperate zone. They are erect, branching, annual or perennial shrubs, with blue or violet, rarely white, racemose flowers; calyx deciduous, petal-like, and irregular. *D. staphisagria*, staves-acre, has seeds which are irritant and narcotic, and yield the alkaloid delphinia. *D. Consolida* is a simple astringent.

DELPHINUS (del-fī'nus), (the Dolphin), one of Ptolemy's original 48 constellations, situated between Vulpecula, Pegasus, Equuleus, Aquarius, and Aquila. It has no stars brighter than

the third magnitude. The names assigned to its stars Alpha and Beta, Sualocin and Rotanev, are merely reversals of the name ("Nicolaus Venator") of an astronomer's assistant who wished to commemorate himself.

DELPHOS, a city of Ohio, in Allen and Van Wert cos. It is on the Miami and Erie canal, and on the Pennsylvania Company, the Toledo, St. Louis, and Western, the Northern Ohio, the Cincinnati, Hamilton and Dayton, and the Ohio Electric railroads. There are railroad repair shops, granite works, flour and paper mills, and manufactures of iron products, printing presses, furniture, etc. Pop. (1910) 5,038; (1920) 5,745.

DEL RIO, a city of Texas, the county-seat of Val Verde co. It is on the Galveston, Harrisburg and San Antonio railroad. Its notable buildings include a hospital, two convents, and a Federal building. It contains the well-known San Felipe springs. It has cotton gins and other industrial establishments and is the center of an agricultural and cattle raising region. It was incorporated in 1910. Pop. (1920) 10,589.

DELSARTE, FRANÇOIS ALEXANDRE NICOLAS CHERI (del-sart'), a French educator; born in Solesmes, Dec. 19, 1811. His father, a physician, sent him to Paris to study with a painter on china 1822, but he entered the Conservatory 1825. He attained distinction as a tenor singer in the Opera Comique, suddenly lost his voice, and thereafter applied himself to musical and dramatic instruction, having among his pupils many who afterward achieved operatic and dramatic celebrity. His chief work was the elaboration of a system of dramatic expression. He aimed to make elocution a science. He died in Paris, July 19, 1871.

DELTA, the name of the fourth Greek letter, corresponding with the English d. As a capital it is formed in the shape of an equilateral triangle. Originally applied to the triangle-shaped island formed by deposits between the two mouths of the Nile; afterward applied to other similarly shaped tracts formed at the mouths of large rivers by two or more diverging branches. The deltas of many rivers, as the Ganges, Niger, Mississippi, etc., are geologically most instructive, exhibiting, as they do, perfect analogues of many of the older formations in magnitude, variety of composition, alternation of beds, and entombment of plants and animals.

DELTA METAL, an alloy consisting of copper and zinc—in other words, brass—to which some manganese has been added in the form of ferro-manganese, or spiegeleisen, which contains manganese. A little silicon is also used, but enough of this is usually present in ferro-manganese. Delta metal has similar properties to phosphor-bronze, if, indeed, some of it is not simply manganese-bronze. It is used for parts of machinery and for ornamental work.

DELUGE, a general overflowing of water, or inundation; specifically, the general inundation or flood in the time of Noah. Three schools of thought or opinion exist with respect to the deluge. (1) The common one that it was universal not merely as regards the human race, but with respect to the world, every part of which, the highest peak of the Himalayas not excepted, was submerged. (2) That while drowning all mankind except the eight persons in the ark, it was partial, being limited to central Asia. The ordinary mind will consider ths view absurd, and say that the water standing high in Central Asia would run over the world, becoming shallower as it went; but the geologist knows that in such a vast flood what appears to the eye the rising of the waters is really the sinking of the land. If the land subsided in central Asia, cracks extending to the Caspian, the Persian Gulf, etc., a deluge would be produced, while a like upheaval of the land would bring it to a termination. (3) Bishop Colenso considers the deluge unhistorical.

The deluge predicted by Noah is described in Gen. vi. vii. viii.; dated by Usher and the English Bible 2348 B. C. Traditions of such an event are found among many races.

The old view that the fossils collected by the geologists were deposited during the Noachian deluge is now held only by the unenlightened.

DELUNDUNG, the weasel-cat (*Prionodon gracilis*), a small quadruped inhabiting the vast forests of the E. extremities of Java and Malacca. It is of pale yellowish-white color, with elegantly-marked stripes and bands of a deep brown. It is allied to the civets, but is destitute of a scent-pouch.

DEMADES (de-mā'dēz), an Athenian orator, who, from a fishmonger, rose to high places in the republic. He was captured by Philip of Macedon in the battle of Chæronea, but soon set at liberty. He afterward exerted his influence in favor of the Macedonian party at Athens, but, betraying Antipater, he was put to death by Cassander, the son of the latter, 318 B. C.

DEMAGOGUE, a ringleader of a faction, or of the rabble; a popular or

factious orator; a party leader; a teacher of sedition.—In its original acceptation, this word was considered an honorable designation; but it is now almost invariably used in a bad sense.

DEMAND AND SUPPLY, in political economy, demand has reference to the quantity of goods asked for in the market, and supply has reference to the quantity of goods offered. The laws of demand and supply may be thus stated: when the demand exceeds the supply, competition grows stronger among the buyers, and prices rise, and when the demand falls short of the supply, competition grows stronger among the sellers, and prices fall; or thus, falling prices tend to lessen the supply and increase the demand, while rising prices tend to increase the supply and lessen the demand. A rise in prices tends to encourage production, while a fall in prices tends to discourage it. Conversely, consumption is promoted by falling and lessened by rising prices.

DEMAREST, WILLIAM HENRY STEELE, an American educator, born in Hudson, N. Y., in 1863. He graduated from Rutgers College in 1883 and from the New Brunswick Theological Seminary in 1888. He was ordained minister to the Reform Church of America in the same year. After serving as pastor in several churches in New York, he became professor of church history at the New Brunswick Theological Seminary in 1901. In 1906 he was chosen president of Rutgers College.

DEMAVEND (dem-ä-vend'), a volcanic mountain of Persia, and the highest peak of the Elbruz chain, 45 miles S. of the Caspian Sea, and about 40 miles N. E. of Teheran. Its height is about 19,400 feet, and it bears evidence of having been active during the latest geological (if not within the historic) period.

DEMBEA, or **TSANA**, a lake of Abyssinia, in a province of the same name in the W. part of that country. It is of irregular form, about 140 miles in circumference, has an elevation of 6,100 feet above the sea, and forms the reservoir of the Blue Nile.

DEMEMBRÉ, or **DISMEMBERED**, a heraldic term to signify that the members of an animal are cut from its body.

DEMENTIA, in common parlance, and even in legal language, a word synonymous with insanity. Medically it is applied to those cases of unsound mind which are characterized by a total loss of the faculty of thought, or by such an imbecility of intellect that the ideas are extremely incoherent.

DEMERARA, (dem-ē-rä'rä), or **DEMARARA** (dem-a-rä'rä), a division of British Guiana, which derives its name from the river Demarara or Demerara. It extends about 100 miles along the coast, lying on the E. of Essequibo, and on the W. of Berbice. The soil is very fertile, producing abundant crops of sugar, coffee, cotton, rice. Chief town, Georgetown. Pop. of province about 125,000. The river, after a course of about 120 miles, flows into the Atlantic.

DEMESNE, or **DOMAIN** (de-mān'), in law, a manor-house and the land adjacent or near, which a lord keeps in his own hands or immediate occupation, for the use of his family, as distinguished from his tenemental lands, distributed among his tenants. See DOMAIN, PUBLIC.

DEMETRIUS I., a king of Syria, surnamed Soter, son of Seleucus Philopater, born 185 B. C. He was sent as hostage to Rome by his father, on whose death Antiochus Epiphanes, and after him his son, Antiochus Eupator, usurped the throne of Syria. The Roman Senate denied him assistance, but the Syrians recognized him for their lawful prince, and he obtained the throne, 162 B. C. He then declared war against the Jews, and in this war Judas Maccabæus lost his life. A confederacy of the neighboring kings was formed against Demetrius, who was slain about 150 B. C.

DEMETRIUS II., called Nicator (conqueror), was the son of the preceding. Ptolemy Philometer, King of Egypt, placed him on the throne of his father, after expelling the usurper, Alexander Balas, 146 B. C. He married Cleopatra, the wife of the same Alexander, and daughter of Ptolemy. He was subsequently taken prisoner by the King of Parthia, who gave him his daughter in marriage, which so incensed Cleopatra, that she married Antiochus Sidetes, her brother-in-law. Sidetes, however, fell in battle, and Demetrius recovered his throne; but he did not retain it long, for he was once more expelled by Alexander Zebina, and was killed by the Governor of Tyre, 126 B. C.

DEMETRIUS, surnamed Poliorcetes, King of Macedonia, was the son of Antigonus. At the age of 22 his father intrusted him with an army against Ptolemy, by whom he was defeated near Gaza. But he soon repaired the loss, and with a fleet of 150 ships sailed to Athens, which he delivered from Demetrius Phalereus. He next took part in the war against Ptolemy, whose fleet he destroyed. In 305 B. C. Demetrius undertook the siege of Rhodes, but after persevering for a year was compelled to

relinquish the attempt. He afterward defeated Cassander at Thermopylæ; but was called to aid Antigonus against Seleucus and Lysimachus, in Asia. The two armies met at Ipsus, 299 B. C.; and after an obstinate battle, the army of Demetrius was defeated, and his father slain, but he himself fled to Ephesus. He, however, mustered a new army, and in 295 B. C. relieved Athens from tyranny. He then slew Alexander, the son of Cassander, and seated himself on the throne of Macedonia. At the end of seven years of constant war he was forced to retire into Asia, where he was reduced to distress. He went to the court of Seleucus, his son-in-law; but a difference breaking out between them, war ensued, and Demetrius was defeated. Deserted by his soldiers, he surrendered himself at length to his son-in-law, who exiled him to Pella, in Syria, where he died 283 B. C.

DEMETRIUS, Czar of Russia, commonly called the false Demetrius, was a native of Jaroslav, and a novice in a monastery, where he was tutored by a monk to personate Demetrius, son of the Czar John Vasilowitz, who had been murdered by Boris Gudenow. Having learned his tale, he went into Lithuania, embraced the Roman Catholic religion, and married the daughter of the palatine Sandomir. In 1604 Demetrius entered Russia at the head of a small army, was joined by a number of Russians and Cossacks, and defeated an army sent against him. On the death of Boris, the people strangled his son, and placed Demetrius on the throne, but his partiality to the Poles, and contempt of the Greek religion, occasioned an insurrection, and he was assassinated in 1606, after reigning about 11 months.

DEMI-BASTION, in fortification, differs from a bastion in having only one flank instead of two and no curtain.

DEMIDOV, or **DEMIDOFF**, a wealthy and influential Russian family, whose head was an armory-founder at Toula. This Demidoff was intrusted by Peter the Great with the business of casting the cannon for that prince's numerous warlike expeditions. In 1725 he discovered the mines of Kolyvan, the working of which speedily enriched him. He left a son, NIKITA, and several grandsons, who distinguished themselves in the same career as their progenitor, and amassed colossal fortunes. The best known of these are PROKOP DEMIDOFF, who worked with great profit the iron, copper, and gold mines of the Ural Mountains; born at Moscow about 1730; NIKOLAY NIKITICH, a zealous philanthropist, who founded establishments of public utility, and carried to a great state of perfection the working of mines. His last years he passed in France and Italy, enjoying the society of learned men. Born near St. Petersburg, 1773; died in Florence, 1828. He left two sons, PAUL and ANATOLE, who, as well as inheriting his fortune, had also the same high taste, and benevolence. Of these, Count Anatole allied himself to the Bonaparte family, by marrying, in 1840, one of Napoleon's nieces, the Princess Mathilde, daughter of Jerome, and sister of Prince Napoleon. Russia, as well as other countries, owe to him the foundation of many valuable charitable institutions. He died in 1858.

DE MILLE, WILLIAM CHURCHILL, an American playwright, born in Washington, N. C., in 1878. He studied at the American Academy of Dramatic Arts and in 1900 became a writer of plays. Among those successfully produced were "Strongheart," "The Warrens of Virginia," "The Land of the Free," and "The Woman." He also prepared and directed many successful moving picture plays.

DEMI-LUNE, in fortification, practically the same as a ravelin.

DEMI-RELIEF, or **DEMI-RILIEVO** (demäi-ril-i-ā'vō), a term applied to sculpture projecting moderately from the face of a wall; half raised, as if cut in two, and half only fixed to the plane. Mezzo-rilievo is a degree between alto and basso-rilievo.

DEMISE, (a laying down), in law a grant by lease; is applied to an estate either in fee-simple, fee-tail, or for a term of life or years. As applied to the crown of England, demise signifies its transmission to the next heir on being laid down by the sovereign at death.

DEMISEMIQUAVER, in music, half a semi-quaver, or the 32d part of a semibreve.

DEMIURGE, in some of the Peloponnesian states the name of a magistrate, probably corresponding to the tribunes of Rome. It is also a name given by the Platonian philosophers to an exalted and mysterious agent, by whom God was supposed to have created the universe. He corresponds to the Logos or Word of St. John and the Platonizing Christians of the Early Church.

DEMOCRACY, that form of government in which the sovereign power is in the hands of the people collectively, and is exercised by them either directly or indirectly through elected representatives or delegates. The third book of Herodotus describes it as it existed in

ancient Greece, the first country perhaps where it was ever allowed scope for development. Aristotle also treated of the subject.

DEMOCRATIC PARTY, one of the two chief divisions into which the voters of the United States are politically associated, first opposed to the Whigs, then to the Republicans.

The complete evolution of the Democratic party may be said to date from the accession of Andrew Jackson to the presidency, though its fundamental principles were enunciated by Thomas Jefferson. The political features of Jackson's administration were the opposition to the United States Bank, the denial of the right of any State to nullify the laws of Congress, and the excitement over the tariff question. In 1836 through the influence of Jackson, Martin Van Buren was elected President, and during his administration the prestige of the Democratic party began to wane. In 1837 the country went through a severe commercial panic. Credit, speculation and banking had been carried to extreme limits and disaster followed. For this state of affairs the administration was held responsible. The election of 1840 was a revolution and in the choice of General Harrison by the electoral vote of 234 to 60 the Democratic party, after an ascendency of its principles entailing 40 years of power, was forced to retire. But the Whig triumph was short-lived. General Harrison died one month after his inauguration and John Tyler, who had been nominated for Vice-President to conciliate Virginia, succeeded to the presidential chair. All his life he had held and advocated Democratic doctrines, especially the opposition to the United States Bank, a protective tariff, and internal improvements by the general government. On his accession he continued the cabinet of his predecessor, Daniel Webster being Secretary of State; but after two successive vetoes of the "Fiscal Bank of the United States" bill, his cabinet left him, Mr. Webster remaining only till the conclusion of the Webster-Ashburton treaty, and his administration became essentially Democratic.

In 1844 James K. Polk was elected President, after a bitter and exciting contest, over Henry Clay. The annexation of Texas, which was urged by the Democratic party, was the great question in determining this election, and was accomplished March 1, 1845, three days before the inauguration of Mr. Polk. This led to a war with Mexico which was declared May 12, 1846. At its successful conclusion not only was the Rio Grande established as the boundary of Texas, but all New Mexico and Upper California were relinquished to the United States. In March, 1820, an act known as the Missouri Compromise, had been passed, forbidding the introduction of slavery in any of the States formed from the Louisiana Cession N. of 36° 30′. On Aug. 8, 1846, the rejection of the so-called Wilmot Proviso by the Senate, which provided "That as an express and fundamental condition to the acquisition of any territory from the Republic of Mexico by the United States....neither slavery nor involuntary servitude shall ever exist in any part of said territory," became the starting point of the Free Soil party in 1848. Mr. Wilmot, the mover, was a Democrat. The popularity of General Taylor caused the defeat of Lewis Cass in the election of 1848, and the Democratic party went out of power till 1853, when Franklin Pierce became President. In 1856 it elected James Buchanan President and John C. Breckenridge Vice-President. At the convention held in Charleston, S. C., April, 1860, the slavery issue caused a disruption of the party, the slave section nominating John C. Breckenridge, and the free, Stephen A. Douglas, and, on Mr. Lincoln's election, it lost the supremacy which it had held with little interruption for 60 years. It had, however, a vigorous life, and contested hotly every presidential election, its unsuccessful candidates being George B. McClellan, 1864; Horatio Seymour, 1868; Horace Greeley, 1872; Samuel J. Tilden, 1876; and Winfield S. Hancock, 1880. In 1884 the party elected its candidate for the presidency, Grover Cleveland. In 1888, Mr. Cleveland, having been renominated, the party was defeated. In 1892 Mr. Cleveland again became the nominee of the party against the sharp and critical opposition of the Democratic organization of his own State (New York).

In the first year of his second administration, Mr. Cleveland called a special session of Congress for the purpose of repealing the law compelling the monthly purchase of silver by the government; and this was accomplished against the determined opposition of many prominent Democrats. Dissension soon therefore arose in the party over the tariff, centering around the so-called Wilson Bill. The opponents of the administration, led by Gorman of Maryland, Brice of Ohio, and others, succeeded in amending the bill to an extent deemed so undemocratic that the President could give it but a qualified approval, and it became a law without his signature. The necessity of issuing bonds for the purpose of maintaining the gold reserve,

thus increasing the public debt, and the adoption of silver free coinage in the platform of 1896 overthrew the party, its presidential candidate, William J. Bryan, being defeated by William McKinley, for whom many Democrats in favor of sound money and the gold standard voted.

In 1904 Alton B. Parker, a conservative democrat, was nominated. Theodore Roosevelt was chosen by the Republicans and elected, having obtained 336 electoral votes to Judge Parker's 140. In 1908 William J. Bryan and William H. Taft were the contestants. Taft won, receiving 321 Electoral votes to Bryan's 162. Taft was again chosen by the Republicans in 1912. The Democratic convention held at Baltimore, June 25, after several days' balloting nominated Woodrow Wilson, Governor of New Jersey. The new Progressive party, in convention assembled at Chicago, August 5, nominated Theodore Roosevelt. The result of the election showed, Wilson 435, Roosevelt 88, and Taft 8. At the Democratic convention held at St. Louis, June, 1916, Woodrow Wilson and Thomas Marshall were nominated by acclamation. Charles E. Hughes of New York and C. W. Fairbanks of Indiana were nominated by the Republicans. The result of the election was a plurality vote for Woodrow Wilson of 581,941. In 1920 the Democrats nominated J. M. Cox, Governor of Ohio, who was defeated by Warren G. Harding, the Republican nominee, by a vote of 16,132,914 to 9,142,438.

DEMOCRITUS (dē-mok'ri-tus), a Greek philosopher of the new Eleatic school, a native of Abdēra, who was born between 470 and 460 B. C. He traveled to Egypt, where he studied geometry. Among the Greek philosophers he enjoyed the instruction of Leucippus. He afterward returned to his native city, where he was placed at the head of public affairs. Indignant at the follies of the Abderites, he resigned his office and retired to devote himself exclusively to philosophical studies.

He explained the origin of the world by the eternal motion of an infinite number of invisible and indivisible bodies or atoms, which differ from one another in form, position, and arrangement, and which have a primary motion, which brings them into contact, and forms innumerable combinations, the result of which is seen in the productions and phenomena of nature.

In this way the universe was formed, fortuitously, without the interposition of a First Cause. He applied his atomical theory, also, to natural philosophy and astronomy. Even the gods he considered to have arisen from atoms, and to be perishable like the rest of things existing. He is said to have written a great deal; but nothing has come to us except a few fragments. He died 370 B. C., at an advanced age. His school was supplanted by that of Epicurus.

DEMODEX, a genus of *arachnida*, usually placed in the family *acarina*. *D. folliculorum* inhabits the sebaceous follicles of the face of many persons, especially in the vicinity of the nose.

DEMOISELLE, a species of crane (*Anthropoides virgo*). It is of a slaty-gray color, with the outer portion of the quill-feathers dingy black; a tuft of feathers from the breast blackish. It is found all over Africa, whence it finds its way occasionally to Europe and India. It is called also the Numidian crane.

DEMOIVRE, ABRAHAM (de-mwa' vr), a French mathematician; born in Vitry, May 26, 1667. He settled in London after the revocation of the Edict of Nantes. His chief works are: "Miscellanea Analytica"; "The Doctrine of Chances, or a Method of Calculating the Probabilities of Events at Play"; and a work on "Annuities," besides "Papers" in the "Transactions" of the Royal Society, of which he was a fellow. He died in London, Nov. 27, 1754.

DEMON, a name given by the ancient Greeks to beings equivalent to those spiritual existences termed angels in the Bible. The word in Scripture is translated devil, but it meant properly a spirit generally, whether good or evil.

DEMONOLOGY, the doctrine that relates to demons, a body of spiritual beings inferior in rank to deities proper, but yet capable of influencing human affairs. The earlier and more widely spread conception of the demon was merely that of a more or less powerful and intermediate agent between gods and men at one time resolving himself into a kind of special guardian or patron-spirit, at another acting as the minister of the divine displeasure.

To primitive man the demon was but one of the thousand spiritual beings who controlled every one of the causes of nature, and whose favor must be purchased by constant tributes of respect and worship. It was perfectly consistent with primitive philosophy that the manes or ghosts of the dead should continue after death the influence they enjoyed in life, and thus should pass into the higher class of deities. It is not merely family affection, but actual fear and considerations of prudence, that lead to the worship of ancestors and of

the dead; and the good or bad fortune of living men is attributed to the direct interference of the invisible spirits with which the whole air around is swarming. These spirits may not only affect the fortune of the individual, but may even enter into his body, and cause internal diseases and such other inexplicable phenomena as frenzy, wild ravings, hysterical epilepsy, and the like.

The very etymology of such words as catalepsy and ecstasy points plainly to a time when there was no metaphor in their meaning. Such is the explanation of disease offered at the present day by savage man all over the world, and such was also the belief of the semi-civilized ancient Egyptians and Babylonians. Indeed, it disappeared but slowly before the progress of scientific medicine, and continued to reappear in survivals strangely perplexing on any other explanation. Hence the function of the exorcist arises naturally as a means of effecting a cure by expelling the demon, and we find him daily exercising his skill in Africa, and even in China and India. In early Christian times those demoniacally possessed, or energumens, were grouped into a class under the care of a special order of clerical exorcists, and after the time of St. Augustine the rite of exorcism came to be applied to all infants before baptism.

DEMOSTHENES (dē-mos'the-nēz), an illustrious orator of ancient Greece, born in 383 or 384 B. C. In 359, to assist in his own support, he began preparing speeches to be used in public suits. In 351 he began a long and memorable conflict against Philip the Macedonian. His speeches, intended to arouse the Greek nation to military zeal, called "Philippics," are among the finest specimens of ancient oratory. In 346 he was one of the peace ambassadors who treated with Philip. During the period from 346 to 340 he was engaged in forming an anti-Macedonian party, and in his attacks upon Æschines for betraying Athens in the peace negotiations with Philip. In 340 war again broke out, ending in the great defeat of the Greeks at Chæronea. It having been proposed by the citizens to present Demosthenes with a crown, in honor of his services to the State, his enemies seized on the opportunity to accuse him. He defended himself on his trial, in a memorable oration "On the Crown," one of his greatest productions.

In 324 Harpalus, the State treasurer of Alexander the Great, who had succeeded Philip in Macedonia, fled to Athens with a great sum of money, which was placed in the Athenian public treasury under the charge of Demosthenes. A portion of it disappeared, and Demosthenes was accused of the embezzlement, and condemned and sentenced to prison, but, escaping, went into exile. On the death of Alexander, 323 B. C., he was recalled, and led an unsuccessful attempt to throw off the Macedonian yoke. After the defeat of the revolting army at Crannon, he fled to Calauria, where he was captured by the Macedonians, and poisoned himself, in 322 B. C.



DEMOSTHENES

DEMOTIC, or ENCHORIAL ALPHABET, a simplification of the hieratic, which again was a contraction of the hieroglyphic characters.

DEMULCENTS, medicines which tend to soothe or protect the mucous membranes against irritants. They are gen-

erally composed of starch, gum, albuminous or oily substances largely diluted.

DEMURRAGE, in maritime law, (1) the time during which a vessel is detained by the freighter beyond what is named in the charter-party in loading or unloading. A vessel thus detained is said to be on demurrage. (2) The compensation or allowance made by the freighter of a vessel for such delay or detention. Demurrage must be paid in every case except when the delay is caused by tempestuous weather, any fault of the owner, captain, or crew of the vessel, or detention by an enemy. The word is also applied to a similar compensation or allowance payable for delay in loading or unloading railway cars beyond a certain specified period allowed for the purpose. In the Bank of England, demurrage is the allowance of 1½d. per ounce made to the bank in exchanging coins or notes for bullion. The metallic value of standard gold is £3 17s. 10½d. per ounce; at the Bank of England £3 17s. 9d. is given for it without any delay. If it were taken to the mint there would be a delay of some days before it could be converted into coin. The difference of 1½d. per ounce, by which this delay is avoided, is called demurrage.

DEMURRER, in law, a stop at some point in the pleadings, and a resting of the decision of the cause on that point; an issue on matter of law. A demurrer confesses the fact or facts to be true, but denies the sufficiency of the facts in point of law to support the claim or defense.

DEMY, a size of paper intervening between royal and crown. Printing demy measures generally 22 inches by 17½, writing 20 inches by 15½, drawing 22 inches by 17.

DENAIN (dĕ-năn'), a town of northern France, in the department of Nord, 6 miles from Valenciennes. It stands in the center of a coal field, and has iron works, etc. A great victory was gained here in 1712 by the French under Villars over the allies under Eugene and Albemarle. Pop. (1906) 23,950.

DENATURED ALCOHOL, Ethyl Alcohol, containing substances "which destroy its character as a beverage or render it unfit for liquid medicinal purposes." (Act of Congress, June 7, 1906; amended March 2, 1907; Act, Oct. 3, 1913). There are two classes of denatured alcohol, one known as "specially denatured," the other as "completely denatured." The use of the former is restricted to certain industries in which the completely denatured article would produce harmful effects, such, for instance, as the manufacture of ether, chloral hydrate and numerous synthetics. The most common formula previously used for completely denaturing alcohol was the addition of 10 per cent. of methyl alcohol and 1 per cent. of benzine. In view, however, of the large number of deaths and cases of total blindness occurring after the Eighteenth Amendment took effect, this formula was revoked in December, 1919, and hereafter no completely denatured alcohol containing more than 2 per cent. methyl alcohol will be allowed on the market. Alcohol is now commonly denatured with pyridin.

DENBIGHSHIRE, a county of north Wales, with an area of 662 square miles. In the northern part the surface is mountainous, about two-thirds being under cultivation. The chief industries are agriculture, including the raising of corn, the making of cheese and butter, and the raising of live stock. There are important coal mines in the county. The chief towns are Denbigh, the capital, Rexham, Ruthin, and Llangollen. Population, about 150,000.

DENBY, EDWIN, an American public official, born at Evansville, Ind., in 1870. He was educated at the Evansville High School. In 1885 he accompanied his father to China, where the latter was United States Minister. He served in the Chinese Imperial Maritime Custom Service from 1887 to 1897, returning, however, to the United States for a time in 1894. He graduated from the Law School of the University of Michigan in 1896, and in the same year was admitted to the bar, engaging in the practice of law in Detroit. During the Spanish-American War he served as gunner's mate on the U. S. S. Yosemite. On the declaration of war between the United States and Germany he enlisted in the United States Marine Corps and was made a sergeant in 1917. He served throughout the war, retiring as a major. In 1902-1903 he was a member of the Michigan House of Representatives, and from 1905 to 1911 was a member of Congress from the First Michigan District. He was selected by President Harding as Secretary of the Navy, and assumed office on March 4, 1921.

DENDERAH (den'der-ä) (the Tentyra of the Greeks and Romans), an Arab village of Upper Egypt, on the left bank of the Nile, 28 miles N. of Thebes, celebrated for its temple dedicated to Athor, the Egyptian Venus.

DENDERMONDE, or **TERMONDE**, a town of Belgium, province of East Flanders, at the confluence of the Dender with the Scheldt, 12 miles N. W. from Brussels. It is strongly fortfied. Manufactures woolens, linens, tobacco, etc. The town was taken by Marlborough in 1706.

DENDRITE, a stone or mineral on or in which are the figures of shrubs, mosses, or other vegetable growth; an arborescent or dendritic mineral. The colors are due to the traces of organic matter, or of oxides of iron, manganese, or titanium.

DENDROPHIS, a genus of snakes, family *Dendrophidæ*, with smooth scales, which are much larger along the back than on the sides; the sides of the abdomen are slightly keeled. This genus occurs in India, the East Indies, and Australia, and its members are not venomous.

D'ENGHIEN. See ENGHIEN.

DENGUE (den'gā), said to be a mistake for English dandy; the disease, when it first made its appearance in the British West India Islands, being called the dandy-fever, from stiffness and constraint caused to the limbs. This the Spaniards mistook for their word *dengue* = prudery, a continued fever common in the United States and in the East and West Indies, and Africa. The chief symptoms are severe pains in forehead, limbs, back, and joints, with an eruption like measles, or rather erysipelas, with painful swellings.

DENIS, or DENYS, ST. (den-ē'), first Bishop of Paris, in the 3d century. He was sent from Rome, about A. D. 250, to convert the pagans of Gaul. He built many churches, and selected Paris as the seat of his bishopric. During the persecution of the Christians under Aurelian, he was condemned to death by the Roman governor Pescennius, and beheaded in 272.

DENIS, ST., a town of France, in the department of Seine, 6 miles N. of Paris. A chapel in honor of St. Denis was founded at this place, in 250. Dagobert was buried here in 580. Dagobert I. founded the abbey in 636, and it has ever since been the place of sepulcher for the French monarchs. The first church was finished in 775, and the present edifice, commenced in 1130, was completed in 1281. A battle between the Roman Catholics and the Huguenots was fought in its vicinity, Nov. 10, 1567, when the latter were victorious, De Montmorenci, the Roman Catholic leader, being mortally wounded. By a decree of the Convention, Aug. 6, 1793, the royal tombs were opened, but they were restored by Napoleon I. in 1806. The abbey was suppressed in 1792. Pop. (1906) 64,790.

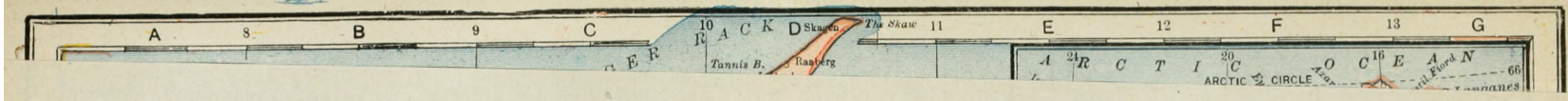
DENIS, or DENNIS, a name much affected by the faithful of the Roman Catholic Church, and particularly among the Irish. The appellation has acquired a similar position in the United States with the name Jonah, for an analogous reason. "Your name is Dennis," means you are doomed to disappointment.

DENISON, a city in Grayson co., Tex.; on the Missouri, Kansas and Texas, the Missouri, Oklahoma and Gulf, the Texas and Pacific, and other railroads; 106 miles N. of Dallas. It is a noted cattle-shipping place; the farming trade center of the surrounding country, and an important railroad point. It has manufactures of cotton, cotton-seed oil, creosote, grain elevators, iron, and machinery, daily and weekly papers, high school, electric lights, water works, and 2 National banks. Pop. (1910) 13,632; (1920) 17,065.

DENNISON UNIVERSITY, an educational institution in Granville, O.; founded in 1831, under the auspices of Baptist Church; reported at the end of 1899: Professors and instructors, 46, students, 900; president, C. W. Chamberlain, D. D.

DENMARK, a kingdom in northern Europe, consisting of a peninsular portion called Jutland, and an extensive archipelago lying E. of it and comprising the islands of Seeland (or Sjalland), Funen (or Fyen), Laaland (or Lolland), Falster, Langeland, Moen, Samso, Laso, Arro, Bornholm, and many smaller ones. Besides these there are the outlying possessions of Iceland, Greenland, and the Faroe islands in the Atlantic Ocean. Denmark is bounded on the S. by Germany and the Baltic; on the W. by the North Sea; on the N. it is separated from Norway by the Skagerrack; and on the E. it is separated from Sweden by the Kattegat and the Sound. Area, 15,289 square miles; pop. (1901) 2,464,770; capital, Copenhagen.

Topography.—The surface of Denmark is very much alike in every part of the kingdom, uniformly low, reaching its highest point in Eirs-Bavnehoj, in S. E. Jutland, which is only 564 feet above sea-level. The country presents little variety, except in its low isolated hills, but does not leave an impression of monotony; in the islands and in the S. E. of Jutland the landscape is broken by forests, meadows, and fields; and even


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B
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C
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D
11
E
12
F
13
G
Skaren
The Skaw
Tunnis B.
Ranberg
ARCTIC CIRCLE
66


DENMARK
WITH
SCHLESWIG-HOLSTEIN
SCALE OF MILES
SCALE OF KILOMETERS
ICELAND
FAEROER
FAROE IS.
JUTLAND
ZEALAND
TO DENMARK BY PLEBISCITE
TO GERMANY BY PLEBISCITE
Flensburg
Husum
Tondern
Hadersleben
Apenrade
Sonderburg
Tondern
Odense
Esbjerg
Ribe
Horsens
Randers
Aalborg
Viborg
Holstebro
Thisted
Frederikshavn
Skagen
Hirtshals
Aalborg
Aarhus
Kolding
Vejle
Fredericia
Nyborg
Svendborg
Korsor
Slagelse
Roskilde
Helsingor
Frederiksborg
COPENHAGEN
(Kjobenhavn)
Kiel
Neumunster
Rendsburg
Itzehoe
Altona
Hamburg
Lubeck
Wismar
Rostock
Warnemunde
Stettin
Stralsund
Greifswald
Stettin Lagoon
Kiel Canal
Kiel Bay
Fehmern Belt
Great Belt
Little Belt
Sound
Oresund
Kattegat
Skagerrak
North Sea
Baltic Sea
Heligoland Bay
Heligoland (Ger.)
Helgoland
Anholt
Gilbert Hovert
Gilfalls
Hesselo
Kullen
Ellsinore
Helsingborg
Landskrona
Malmo
Trelleborg
Ystad
Simrishamn
Bornholm
Ronne
Gudhjem
Sandvig
Hasle
Aakirkeby
Nexo
Allinge
Gronne
Rixo
Skelskor
Kallundborg
Nykjobing
Stege
Faxe
Ringsted
Roskilde Fiord
Isefiord
Kjoge Bay
Faister
Laaland
Falster
Moen
Saxkjobing
Nakskov Bay
Nakskov
Rudkjobing
Langeland
Aero
Aero Sound
Alsen
Alsen Sound
Flensburg Fiord
Apenrade Fiord
Sonderburg Fiord
Tondern Fiord
Hjerting Fiord
Ringkjobing Fiord
Nissum Fiord
Limfiord
Mariager Fiord
Randers Fiord
Esbjerg Bay
Horsens Fiord
Veile Fiord
Kolding Fiord
Odense Fiord
Roskilde Fiord
Isefiord
Kjoge Bay
Faxe Bay
Stege Bay
Nakskov Bay
Rudkjobing Bay
Aero Sound

in the W. and N. of the mainland the stretches of moorland are clothed with heather, and have a solemn beauty. The coast seldom rises even to low cliffs; generally it is flat, skirted by sand-ridges and shallow lagoons, especially along the W. side, where the dunes cover an area of nearly 225 square miles. The E. coast is much indented by bays, useful for navigation and valuable for their fisheries: here and in the islands are many good harbors. Both the continental portion and the islands are penetrated deeply by numerous fjords, the largest being Limfjord, which intersects Jutland and has insulated the N. extremity of the peninsula since 1825, when it broke through the narrow isthmus which had separated it from the North Sea. From its formation, the kingdom can have no rivers, properly so called; its streams, called Aa, are mostly large brooks. There are several important canals, however, including in Jutland works for the canalization of the Guden-Aa, its largest stream, and of the Limfjord. Lakes abound in all parts of the kingdom, the most considerable being found in Seeland.

Climate, Commerce, and Productions.—Owing to the lowness of the land and its proximity to the sea on all sides, the climate is remarkably temperate for so northerly a region, though the thermometer in winter may sink to 22° below zero, and in summer rise to 89°. Violents winds are frequent, and rains and fogs prevalent, but the climate is favorable to vegetation. The soils of Jutland are generally light, but those in the S. E. part and in the islands are stronger; about 80 per cent. of the area of Denmark is productive, and of the remainder about one-sixth is in peat-bogs. Nearly half of the population is engaged in agriculture; the land for the most part is parceled out into small holdings, and this is encouraged by the laws, which since 1849 have prohibited the throwing of small farms into large estates. The center and W. of Jutland is nearly bare of wood, but in the other parts of the peninsula the forests cover about 215,000 acres, and in the islands over 291,000 acres. The beech, which flourishes more luxuriantly in Denmark than in any other land, is almost universally predominant, though three centuries ago the oak, now comparatively rare, was the characteristic Danish tree. Peat, which is obtained in abundance from the bogs, brown coal or lignite, and seaweed, generally take the place of wood as fuel. Porcelain clay and some coal are found in Bornholm; fuller's earth, potter's clay, saltpeter, chalk, and a poor marble occur in several parts of the kingdom, while some amber is collected on the W. coast of Jutland.

In 1919 there were produced of the principal crops the following amounts in tons: wheat, 161,200; rye, 378,700; barley, 533,900; oats, 690,700; mixed grain, 397,000; and potatoes, 1,440,800. There were in 1919 558,471 horses; 2,188,142 head of cattle; 509,466 sheep; 715,909 swine; and 12,134,521 poultry.

In 1914 there were 82,442 industrial establishments, employing 346,000 persons. Among the most important productions are distilled liquors and beet sugar. There were, in 1919, 21 distilleries, which produced 2,390,000 liters of brandy. In the same year the production of beet sugar was 141,300 tons.

Fisheries are important, and the value of the catch in 1918 was £2,318,866. Over 20,000 persons are engaged in the fisheries and over 15,000 boats are employed.

The imports in 1919 were valued at £139,390,000, and the exports at £51,042,000. These figures may be compared with those of 1914, in which year the imports amounted to £44,182,666, and the exports to £48,191,444. The exports of home produce in 1919 amounted to £41,299,000. The principal imports are food substances, fuel, raw products, and industrial products. The chief exports are butter, eggs, bacon, and other agricultural and dairy products.

Denmark is one of the most important countries engaged in mercantile marine. There were in 1919 3,366 vessels, with 470,989 tons, engaged in foreign commerce. In the same year 18,965 vessels entered Danish ports from foreign countries and 19,224 vessels cleared from Danish ports.

Finances.—The total revenue for 1919 and 1920 was £23,957,514 from current revenue, and £8,662,203 from the state capital. The expenditures amounted to £26,205,779 for current expenditure, and £4,358,072 for the increase of state capital. A reserve fund of a comparatively large amount is maintained. This in 1919 amounted to £623,189. The public debt in 1919 amounted to £43,361,483. The total foreign debt amounted to £14,296,273.

Railways.—There were in 1919 about 2,700 miles of railway, of which about 1,275 belonged to the state.

Government.—Denmark was originally an elective monarchy. In 1661 it became a hereditary and absolute monarchy, and in 1849 a hereditary constitutional monarchy, the legislative power being in the king and Diet jointly. The present government is founded on the

charter of 1915. The Diet or Rigsdag consists of two chambers, the Landsthing or Upper House, the Folkething or Lower House. The former is a Senate of 72 members. The members of the Folkething are 140 in number, directly elected by universal suffrage, and hold their seats for four years. The Rigsdag meets every October, and all money bills must be submitted to the Lower House.

Education.—At the head of the educational institutions stand the University of Copenhagen and the Holberg Academy at Soröe. The provinces are well supplied with gymnasia and middle schools, and primary instruction is given at the public expense in the parochial schools. The public schools, with a few exceptions, are free. There were in 1919 3,466 public elementary schools, with 406,000 pupils. In addition to the elementary schools there are 13 government grammar schools. These, together with 140 private schools, had an attendance of about 60,000 pupils. Between the ages of 7 and 14 elementary education is free and compulsory. The schools are maintained by communal taxes. For higher instruction there are, besides the institutions mentioned, a veterinary and agricultural college at Copenhagen, agricultural schools, technical and commercial schools, and high and Latin schools.

Army and Navy.—The army of Denmark is a national militia, resembling in some points the Swiss system. Every able-bodied man is liable to service in the army and navy, except the inhabitants of Greenland, Iceland and the Faroe Islands. The total peace strength of the army is 78,000 men, with an additional force available on mobilization of 105,000. About 13,000 recruits are trained annually. The military budget for 1919-1920 was 16,969,613 kroner, with 50,000 kroner additional for the Flying Corps. The navy of Denmark is maintained only for the purpose of coast defense. It consists of monitors, 2 small cruisers, 2 mine layers, 23 first-class torpedo boats, and 12 submarines.

Religion.—The established religion is the Lutheran which was introduced in 1536. The affairs of the national Church are under the superintendence of seven bishops. Complete religious toleration is extended to every sect, and no civil disabilities attach to dissenters.

History.—The oldest inhabitants of Denmark were the Cimbri, who dwelt in the peninsula of Jutland, the Chersonesus Cimbrica of the Romans. They first struck terror into the Romans by their incursion, with the Teutons, into the rich provinces of Gaul (113-101 B.C.). After this, led by the mysterious Odin, the Goths broke into Scandinavia, and appointed chiefs from their own nation over Denmark, Norway, and Sweden. For a considerable time Denmark was divided into a number of small states, whose inhabitants lived mostly by piracy along the neighboring coasts. In 787 they began to make their descents on the E. coast of England, and along with other inhabitants of Scandinavia they conquered Normandy in 876-877. Under Gorm the Old all the small Danish states were united in 920, and his grandson Sweyn, now the head of a powerful kingdom, began the conquest of Norway and of England, which was ultimately completed by his son Canute. Canute died in 1035, leaving a powerful kingdom to his successors, who, in 1042, lost England, and in 1047 Norway. In 1047 Sweyn Magnus Estridsen ascended the throne, but with the exception of the great Waldemar the new dynasty furnished no worthy ruler, and the power of the kingdom decayed considerably till the accession of the politic Queen Margaret in 1387, who established the union of Calmar in 1397, uniting under her rule Denmark, Sweden, and Norway. In 1448 Christian I., Count of Oldenburg, was elected to the throne, thus founding the royal family of Oldenburg, which kept possession of the throne till 1863. Under the rule of Christian, Norway, Sweden, Schleswig, and Holstein were connected with the crown of Denmark, but under his successor, Christian II., Sweden established its independence. Under Frederick I. (1523-1533) the Reformation was introduced. Christian IV. of Denmark ascended the throne in 1588, took part in the Thirty Years' War, and engaged twice in a war with Sweden, with most unfortunate results. Frederick III., again engaging in war with Sweden in 1657, was equally unsuccessful. Christian V. and Frederick IV. were conquered in the war with Charles XII. Denmark, however, after the fall of Charles XII., gained, by the peace of 1720, the toll on the Sound, and maintained possession of Schleswig. After this Denmark enjoyed a long repose. In 1800, having joined the Northern Confederacy, the kingdom was involved in a war with Great Britain, in which the Danish fleet was defeated at Copenhagen, April 2, 1801. In 1807, there being reason to think that Denmark would join the alliance with France, a British fleet was sent up the Sound to demand a defensive alliance or the surrender of the Danish fleet as a pledge of neutrality. Both were denied, till the Danish capital was bombarded and forced to capitulate, the whole fleet being

delivered up to the British. The war, however, was continued, Denmark forming new alliances with Napoleon till 1814, when a peace was concluded by which she ceded Heligoland to England in exchange for the Danish West India Islands, and Norway to Sweden in exchange for Swedish Pomerania and Rügen, which, however, she shortly after surrendered to Prussia, receiving in return Lauenburg and a pecuniary compensation. In June, 1815, the king entered into the German Confederacy as representing Holstein and Lauenburg. In 1848 Schleswig and Holstein revolted and were not finally subdued till 1852. In 1857 the Sound dues were abolished. Frederick VII. died in 1863 and with him the Oldenburg line became extinct. He was succeeded by Christian IX. (Prince of Sonderburg-Glücksburg). At the beginning of 1864 the Danish territory was politically distributed into four parts, viz., Denmark proper (consisting of the Danish islands and North Jutland), the duchy of Schleswig or South Jutland, with a population more than one-half Danish, the remainder Frisian and German; the duchy of Holstein, purely German; the duchy of Lauenburg, also German. The measures of the Danish government compelling the use of the Danish language in state schools having given great umbrage to the German population of the duchies, the disputes resulted in the intervention of the German Confederation, and ultimately Holstein was occupied by the troops of Austria and Prussia (1864). After a short campaign the Prussians captured Alsen, overran the greater part of Jutland, and forced the Danes to accept peace (Aug. 1), by which they renounced their right to the duchies of Schleswig, Holstein, and Lauenburg. A difference now arose between Austria and Prussia as to what should be done with the duchies, and Prussia showing an evident intention of annexing them, the result was a war between the two powers, which ended in the total defeat of Austria at Sadowa, or Königgrätz, July 3, 1866. By the treaty which followed Austria relinquished all claim to the duchies, which thus fell to Prussia.

Christian IX. died January 29, 1906. He was succeeded by his son Frederick VIII. The latter proved to be a popular sovereign, but his reign was short-lived, as he died suddenly on May 14, 1912, while on a visit to Hamburg. He was succeeded by his son, Christian X. Important amendments were made to the constitution in 1914 and 1915. Among these provisions was the abolition of the property classification which hitherto prevented the poorer classes from voting for the Landsthing. Another amendment was passed for universal suffrage, including suffrage for women.

The outbreak of the World War raised vital problems in Denmark. On account of the bitter feeling toward Prussia as the result of the seizure of Schleswig-Holstein, there was an overwhelming pro-Ally sentiment in the kingdom. The government, however, remained neutral throughout the war. Denmark suffered severely from the blockade established against Germany and in the loss of ships in the submarine warfare. This was to a large extent, however, offset by the prosperity of the agricultural classes as a result of the demand for their products both in Germany and in the Allied countries. Germany secured enormous quantities of foodstuffs both by the regular method of trade and through smuggling across the border. By 1917, however, economic conditions in Denmark had become exceedingly difficult and it was found necessary to ration both bread and coal. The import of coal had stopped with the outbreak of the war to such an extent that it became necessary to curtail its consumption. Trade in wheat, butter, sugar, and other foodstuffs was strictly regulated. With the end of the war, conditions quickly improved. At the meeting of the Peace Conference in Paris, Denmark made known her desire to have restored to her the strictly Danish parts of Schleswig-Holstein, and demanded that those parts in which the population was partially Danish and partially German should be allowed to decide for themselves their future political status. These articles were acceded to and provision was made by the Treaty that within 10 days after it had been put into operation the people in the zones of Schleswig would be allowed to decide for Danish or German nationality by a popular vote. The country was divided into three zones, in the first of which, the farthest removed from Germany, the people would vote for or against reunion of Denmark en bloc; in the second zone the voting was to be done by municipalities, not later than 5 weeks after the vote in the first zone; in the third zone no vote was to be taken.

The plebiscite was held in February, 1920. The northern zone, or North Schleswig, voted by a large majority to join with Denmark; the southern zone, or southern Schleswig, voted to adhere to Prussia. North Schleswig, therefore, was incorporated into the kingdom of Denmark, on July 9, 1920. The occasion was celebrated all over the country. The king and queen made a progress into North Schleswig and were received with jubilation by the people. On Sept.

8, 1920, an amendment to the Danish constitution, incorporating North Schleswig into Denmark was ratified in a general referendum, 613,471 voting "yes," against 19,490 voting "no." The constitution required that an amendment must be ratified by at least 45% of the total number of persons entitled to vote.

The islands comprising the Danish West Indies were sold to the United States for $25,000,000. A treaty providing for the transfer was ratified by Denmark on Dec. 22, 1916, and by the United States on Jan. 16, 1917. See VIRGIN ISLAND.

DENNEWITZ (den'e-vits), a small Prussian village in the circle of Potsdam, province of Brandenburg, famous for the battle between the French and Prussians, Sept. 6, 1813, in which the latter, aided toward the end by Russian and Swedish armies, were victorious.

DENNEY, JOSEPH VILLIERS, an American educator, born at Aurora, Ill., in 1862. He graduated from the University of Michigan in 1885 and studied law in the law department of the same institution. After carrying on post-graduate studies in Germany and France he engaged in journalism for two years. He was then engaged in teaching in the high schools until 1891, when he was appointed assistant professor of rhetoric at the Ohio State University. He became successively professor of rhetoric and English literature, and dean of the College of Arts, Philosophy, and Science at that institution. He was a member of several learned societies and was the editor of many well-known works in English language and literature.

DENNISON, a village of Ohio, in Tuscarawas co. It is on the Pittsburgh, Cincinnati, Chicago, and St. Louis Railroad and on the Panhandle Ohio Canal. The notable buildings include a hospital and a public library, and its industries include railway workshops and sewer-pipe works. Pop. (1910) 4,008; (1920) 5,524.

DENNY, COLLINS, an American Methodist Episcopal bishop and educator, born in Winchester, Va., in 1854. He graduated from Princeton University in 1876 and after studying law began practicing in Baltimore in 1877. In 1880 he entered the ministry of the Methodist Episcopal Church of the South and was engaged in missions with that denomination for several years, and from 1891 to 1910 he was professor of mental and moral philosophy at the Vanderbilt University. In the latter year he was appointed bishop of the Methodist Episcopal Church of the South. From 1910 he was secretary of the College of Bishops. He was a member of the Virginia Council of National Defense in 1917. He was also a member of the Virginia War History Commission. He was a frequent contributor to denominational magazines.

DENNY, GEORGE HUTCHESON, an American educator, born in Hanover county, Va., in 1870. He graduated from Hampden-Sidney College in 1891 and afterward took post-graduate studies in several universities, becoming a tutor in Hampton-Sidney College. From 1896 to 1899 he was professor of Latin, acting president, and president of Washington and Lee University, and in 1912 was elected president of the University of Alabama. He was a member of many educational societies and in 1912 was president of the Alabama State Board of Arbitration. He was the author of several books on educational subjects.

DENSITY, that quality of a body which depends upon the denseness or close cohesion of its constituent particles. It is estimated by the proportion which the bulk bears to the weight. Thus, if there be two bodies of equal bulk, but of different weights, then the body of greater weight is of greater density. Thus the density is seen to be directly proportional to the quantity of matter, and indirectly proportional to the bulk.

DENTALIUM, a genus of gasteropodous mollusks, the shell of which consists of a tubular arcuated cone open at both ends, and resembling the tusk of an elephant in miniature. There are many species known by the common name of tooth-shells.

DENTARIA, coral-root, a genus of plants, natural order *Cruciferæ*. There are about 20 species, natives of temperate countries. They are ornamental herbs, with creeping singularly toothed root-stocks, from which they receive the names of coral-root and toothwort. The stem-leaves are opposite or in whorls of three, and the flowers are large and purple. *D. bulbifĕra*, the only British species, is a rare plant in the S. E. of England. *D. diphylla*, or pepperwort, a North American species, has roots that are used as mustard.

DENTEX, a genus of acanthopterygious fishes, belonging to the family *sparidæ*. In each jaw there is a row of strong, conic teeth. The dorsal fin is slightly emarginate. *D. vulgaris*, also called the four-toothed sparus, is a large fish. It is a native of the mouths of the rivers in Dalmatia and the Levant.

DENTIN, or **DENTINE**, that tissue which forms the body of the tooth, the others being cement, which forms the outer crust; and enamel, which (when present) is situated between the dentin and the cement. It is composed of an organized animal basis, arranged in the form of minute tubes and cells of earthy particles.

DENTIROSTRES, a tribe of birds of the order *Insessores*, or perchers; so named from having a notch near the tip of the beak in the upper mandible. They include the shrikes, butcher-birds, etc. The tribe is divided into the following families: (1) *Laniidæ* (shrikes), (2) *Ampelidæ* (chatterers), (3) *Muscicapidæ* (fly-catchers), (4) *Turdidæ* (*thrushes*), and (5) *Sylvidæ* (warblers).

DENTISTRY, the art of cleaning and extracting teeth, of repairing them when diseased, and replacing them when necessary by artificial ones. There are two very distinct branches of the art now recognized, one being dental surgery, the other mechanical dentistry. The first requires an extended medical knowledge on the part of the practitioner, as, for instance, a knowledge of diseases the effects of which may reach the teeth, of the connection between the welfare of the teeth and the general system, etc., as well as ability to discern latent oral diseases, calculate the effects of operations, etc.

The second department, mechanical dentistry, is concerned with the construction of artificial substitutes for lost teeth, and requires much mechanical science, it being a very delicate work to give artificial teeth a perfectly natural appearance in shape and color. In the United States the Baltimore College of Dental Surgery is the oldest, its charter being dated 1839; the Ohio College of Dental Surgery followed in 1845; the Philadelphia College of Surgery in 1850; the Philadelphia Dental College in 1863; the New York College of Dentistry in 1865, and various others. The "American Journal and Library of Dental Science" was established in Baltimore in 1839. Every State has now its State Dental Society; besides national organizations, of which the American Dental Association is among the most important.

DENTON, a city of Texas, the county-seat of Denton co. It is on the Missouri, Kansas and Texas, and the Texas and Pacific railroads. It is an important trading point for cotton, wheat, corn, and cattle. The city is the seat of the North Texas State Normal College, and the College of Industrial Arts. Pop. (1910) 4,732; (1920) 7,626.

D'ENTRECASTEAUX ISLANDS (don-tr-käs-to'), since 1884 part of the British protectorate of New Guinea, lie N. of the S. E. extremity of New Guinea. With an area of 1,083 square miles, they comprise three chief islands separated by narrow channels. They are named after the French admiral and explorer, Bruni D'Entrecasteaux (1739-1793), who visited these waters in 1792. His name is also preserved in D'Entrecasteaux Point on the S. W. coast of Western Australia; and in D'Entrecasteaux Channel, separating the S. of Tasmania from Bruné Island.

DENUDATION, the act of making naked or bare; a stripping or denuding. In geology, the laying bare by removal of superficial matter so as to disclose the subjacent strata; so also is the removal by water of any formation or part of a formation. Thus we hear of denuded rocks or of a strata removed by denudation.

In medicine, the word is applied to the condition of a part deprived of its natural coverings, whether by wound, gangrene, or abscess. It is particularly applied to the bones when deprived of their periosteum, and to the teeth when they lose their enamel or dental substance.

A valley of denudation is a valley formed by the denudation of the strata in which it is hollowed out.

DENVER, the capital of Colorado, the county-seat of Denver co. It is at the junction of the South Platte river and Cherry creek, and on the Santa Fe, the Colorado and Southern, the Burlington, the Denver and Salt Lake, the Rock Island, and the Union Pacific railroads. Denver is the logical distributing point for territory extending over 1,700 miles east and west and over 1,600 miles north and south and containing a population of approximately 21,000,000 people. The city is situated at an altitude of one mile above sea-level and it is within 15 miles of the eastern base of the Rocky Mountains. On account of the remarkable clearness of the atmosphere and the mildness of the climate, Denver makes an especially desirable residence for persons suffering with pulmonary complaints. It has an area of over 60 square miles. Although the city is distinctly residential, it is also an important industrial center. It has a manufacturing output of over $100,000,000 annually. Its proximity to the important great mining regions of Colorado makes it the central distributing point for this region. Mining machinery is manufactured on a large scale. There are large stock yards comprising more than 150 acres and representing an investment of nearly $15,000,000. It is

an important jobbing center for the surrounding country. It is the center of a retail trade for territory extending 600 miles in every direction. Denver is the financial center of the Rocky Mountain region. It has a branch of the Federal Reserve Bank of the 10th District. The clearings of the banks of the city in 1919 amounted to $1,574,992,155. There are 5 National banks. Within the city are 35 parks with a total area of 1,321 acres. This includes the city park with an area of 480 acres. There are over 230 miles of surface streets and 57 miles of paved streets. All down-town streets have ornamental lighting systems. Among the notable public buildings are the postoffice, costing, with its site, $2,500,000; the State capitol costing $2,800,000; the Municipal Auditorium, costing $750,000, and having a seating capacity of 12,000; the Colorado Museum of Natural History; St. John's Cathedral; and many handsome business buildings. There is a civic center, 13 acres in extent, which cost $1,500,000 for the land alone. This contains a Greek open air theatre. There is an excellent school system, with a total enrolment of over 40,000 pupils, with a teaching staff of approximately 1,300. There are 60 grade schools, 5 high schools, 1 evening school, 1 opportunity school, and 5 junior high schools. Within the city limits are the University of Denver, the Wolcott School for Girls, the Loretta Heights Academy, the Colorado Women's College, and the Sacred Heart College for Boys. There is a public library erected at a cost of $300,000, with 6 branch libraries.

Denver was founded in 1858 and in the following year was incorporated as a city and was named in honor of General J. W. Denver, then Governor of Kansas. It was re-incorporated in 1861 and in 1867 became the capital of the territory. It was first connected by rail with the East and South in 1870, on completion of the Denver Pacific and Kansas Pacific railroads. Pop. (1900) 133,859; (1910) 213,381; (1920) 256,491.

DENVER, UNIVERSITY OF, a coeducational institution in Denver, Colo.; founded in 1864 under the auspices of the Methodist Episcopal Church; reported at the close of 1900: Professors and instructors, 131; students, 1,450; chancellor, H. A. Bucktel, D. D.

DENYS. See DENIS.

DEODAND, a personal chattel, which had been the immediate cause of the death of any person, as if a horse struck his keeper and so killed him, or if a tree fell and killed a passer-by. In these and such cases that which caused the death was to be given to God—that is, forfeited to the crown—to be sold or otherwise disposed of, and the proceeds applied to religious uses or charity. No deodand was due where an infant under the age of discretion was killed by a fall from a cart, or horse, or the like. The right to deodands within certain limits was frequently granted by the crown to individuals. Deodands were abolished in 1846.

DEODAR (*Cedrus deodara*), a large tree, attaining to the height of 100 feet, a native of the Himalayas, and similar in habit of growth to the Cedar of Lebanon, of which it is thought by some to be only a variety. Its timber is much valued and used in India. The name deodar is also locally applied to other trees, especially *Coniferæ*, in India, as at Simla, to the *Cupressus torulosa*. The *C. deodara* yields by exudation, and partly by heat, a kind of turpentine, resin, and pitch.

DEODORIZER, one who or that which deodorizes; specifically, any substance which has the power or quality of destroying any fetid, infectious, or noxious effluvia, such as chloride of lime, carbolic acid, etc. A drug or pastille applied to, or burned in the presence of, putrescent, purulent, infectious, or fetid matter.

DEONTOLOGY, the science of duty; a term used by certain philosophic schools (Bentham, Spencer, and others) to denote their doctrine of ethics.

DEPARTMENT, a term used to denote a territorial division in France. Previous to the Revolution, France was divided into provinces; but in 1790 a decree of the Assembly ordered the abolition of the old provincial divisions (34 in number), and the redistribution of the land into 83 departments. During the year 8 of the Revolution, these were increased to 98; in 1814 the empire consisted of 130; and the war of 1870-1871 reduced it from 89 to 87, including the sadly diminished department of Haut-Rhin. The departments, each presided over by a prefect, are again subdivided into arrondissements.

DE PAUW UNIVERSITY, a coeducational institution in Greencastle, Ind.; founded in 1837, under the auspices of the Methodist Episcopal Church; reported at the end of 1899: Professors and instructors, 53; students, 853; volumes in the library, 48,000; productive funds, $2,115,794; income, $161,379; president, George Richmond Grose, D.D., LL.D.

DE PERE, a city of Wisconsin, in Brown co. It is on the Fox river, and on the Chicago and Northwestern, and the Chicago, Milwaukee and St. Paul railroads, and is a port of call of lake steamers. Its industries include the manufac-

ture of bricks, pottery, writing paper, boilers, gasoline engines, yachts, woolen goods, etc. It is the seat of St. Norbert's College. In the neighborhood are important limestone quarries. There is a considerable trade in cattle, grain, and hay. The river is spanned by a bridge 1,600 feet long. Pop. (1910) 4,447; (1920) 5,165.

DEPEW, CHAUNCEY MITCHELL, an American lawyer; born in Peekskill, N. Y., April 23, 1834, of Huguenot and Puritan ancestry; was graduated at Yale College in 1856, and was admitted to the bar in 1858. In 1860 he worked for the election of Lincoln; 1861-1862, was a member of the New York Assembly, and served some time as chairman of the Committee of Ways and Means, and as acting speaker; 1863, elected Secretary of State of New York; 1865, declined a renomination, and 1866 was commissioned collector of the port of New York by President Johnson, who afterward tore up the commission in a quarrel. He was appointed United States Minister to Japan, and after holding the commission a month declined, and began his career as a railroad official as attorney for the New York and Harlem Railroad. He was made attorney and director of the consolidated Hudson River and New York Central Railroads in 1869; general counsel of the whole Vanderbilt system in 1875; second vice-president of the reorganized New York Central Railroad in 1882, and president in 1885. His political career since 1866 embraces his unsuccessful candidacy as lieutenant-governor on the Liberal Republican ticket in 1872; his election by the Legislature as a regent of the State University in 1874; his candidacy for United States Senator to succeed Thomas C. Platt, in which he withdrew his name after 82 days of balloting in 1881; his declination of the United States senatorship tendered by the Republicans of the Legislature in 1884; his candidacy for the presidential nomination in the national convention in 1888; and his election to the United States Senate 1899—1911.

In 1905 he was involved in the investigation of the New York life insurance companies and repaid a loan obtained from the Equitable, for a concern in which he was interested. At the same time he resigned his directorship in the Equitable. Two volumes of his orations and after-dinner speeches have been published.

DE PEYSTER, JOHANNES, a New York merchant; born in Haarlem, Holland, in 1600; was one of the early settlers of New York; and became prominent in public affairs during the Dutch possession; was one of the last to swear allegiance to the crown after the English succeeded to the government; served several times as alderman and deputy mayor. One son, Abraham, became chief-justice, president of the king's council, and acting governor; another, Johannes, mayor; a third, Isaac, member of the Legislature; and a fourth, Cornelius, first chamberlain of New York. He died in New York about 1685.

DEPHLOGISTICATED AIR, an old name for oxygen, which chemists regarded as common air deprived of phlogiston.

DEPILATORIES (I pull out the hair), chemical agents employed for removing superfluous hair from the skin.

DEPONENT, a term in Latin grammar applied to verbs having a passive form but an active signification. They are so called because they, as it were, lay down (Lat. *depono*) or dispense with the signification proper to their form. Deponent is also used in law for a person who makes a deposition.

DEPOSIT, in law, something given or intrusted to another as security for the performance of a contract, as a sum of money or a deed. In commerce, a deposit is generally either money received by banking or commercial companies with a view to employ it in their business, or documents, bonds, etc., lodged in security for loans.

DEPOSIT, in geology, a layer of matter formed by the settling down of mud, gravel, stones, detritus, organic remains, etc., which had been held in suspension in water.

DEPOSITION, the evidence or statement of a witness on oath or affirmation, signed by the justice or other duly authorized official before whom it is given; an affidavit.

DÉPÔT (dā'pō or dep'ō), a French word in general use as a term for a place where goods are received and stored; hence, in military matters, a magazine where arms, ammunition, etc., are kept. The term is now usually applied to those companies of a regiment which remain at home when the rest are away on foreign service. In the United States it is the common term for a railway station.

DEPRIVATION, the removing of a clergyman from his benefice on account of heresy, misconduct, etc. It entails, of course, loss of all emoluments, but not the loss of clerical character.

DE PROFUNDIS, in the liturgy of the Roman Catholic Church, one of the

seven penitential psalms, the 130th of the Psalms of David, which in the Vulgate begins with these words, signifying, "Out of the depths." It is sung when the bodies of the dead are committed to the grave.

DEPUTY, one who exercises an office as representing another. Chamber of Deputies: the lower of the two legislative chambers in France and in Italy, elected by popular suffrage, and corresponding in some respects to the House of Commons in Great Britain.

DE QUINCEY, THOMAS, an English author; born in Manchester, Aug. 15, 1785. He received a classical education at the grammar-school of Bath, and entered the University of Oxford in 1803, where he remained till 1808. While there he contracted the habit of eating opium. In 1809, after leaving Oxford, he resided at Grasmere for 27 years. Here he cultivated the friendship of Wordsworth, Coleridge, Southey, and other distinguished authors. He made German literature and philosophy his special study, and translated some of the works of Kant, Fichte, Schelling, Lessing, and Richter. At first he took opium only once a week, but gradually the evil habit grew upon him, and at last he took it daily. The consequences he describes in his principal work, "The Confessions of an English Opium-eater." In 1823 he went to London, where he published his "Suspiria de Profundis," his "Templar's Dialogues," etc. His published works include: "Letters to a Young Man Whose Education has been Neglected" (1823); "Logic of Political Economy" (1844); "Klosterheim" (1839); etc. He died in Lasswade, near Edinburgh, Dec. 8, 1859.

DERAJAT (der-a-jät'), the fluvial portion of Daman, itself a comparatively narrow strip in the Punjab, India, between the Suliman Mountains and the Indus, and which, when duly irrigated, is singularly fertile. It is divided into four districts and has an area of 20,300 square miles, and a population (1891) of 1,643,600. Dera Ghazi Khan, the capital of one of the districts, is about 2 miles W. of the Indus. Pop. 27,886. Dera Ismail Khan, capital of another district, is 4½ miles W. of the Indus. Pop. 26,884.

DERBEND (der-bend'), or **DERBENT** (der-bent') ("gateway"), a port and capital of the former Russian district of Daghestan, on the W. shore of the Caspian, 140 miles N. W. of Baku. It is charmingly situated among vineyards and orchards and fields of maize and madder, on the declivity of a branch of the Caucasus, which here approaches very close to the water's edge. Derbend is surrounded by ancient walls. The upper city forms the citadel, and contains the splendid palace of the ancient khans, now the residence of the Russian governor. The harbor is inaccessible to all but small vessels; but a considerable trade is done at the four large markets held here yearly. Silk and cotton fabrics earthenware and weapons are manufactured, and saffron is cultivated. Derbend was long considered the key of Persia on the N. W. side. It was captured by the Arabs in 728, by the Mongols in 1220, and frequently changed hands before it was formally incorporated with Russian Caucasia in 1813. In 1920 Daghestan was in the hands of the Bolshevik government of Russia. Pop. about 15,000.

DERBY, a city in New Haven co., Conn.; at the confluence of the Naugatuck and Housatonic rivers, and on the New York, New Haven and Hartford railroad; 9 miles W. of New Haven. In 1893 the towns of Birmingham and Derby were consolidated and incorporated as the city of Derby. It is a manufacturing city of much importance and has abundant water power from the two rivers. There are extensive manufactures of brass and iron goods, paper, pins, typewriters, pianos, hosiery, guns, and ammunition, and at one time the old town had a large West India trade and noted shipbuilding yards. A bridge across the Naugatuck river connects Derby with the thrifty manufacturing city of Ansonia. It has several parks, daily and weekly newspapers and a National bank. Pop. (1910) 8,991; (1920) 11,238.

DERBY, a municipal and parliamentary borough in England, capital of Derbyshire, on the Derwent, here crossed by an elegant bridge of three arches, 115 miles N. N. W. of London. It is pleasantly situated in a wide and fertile valley open to the S., and is well and regularly built in the modern quarter. It has some fine public buildings, among which are the churches of All Saints, St. Alkmund, and St. Werburgh, the county hall, school of art, infirmary, etc. There is also a very handsome free library and museum. The principal manufactures are silk, cotton, paper, articles in Derbyshire spar, castings, and porcelain, etc. Derby is one of the oldest towns in the kingdom, and is supposed to owe its origin to a Roman station, Derventio, situated at Little Chester, on the opposite side of the river. Under the Danes it took the name of Deoraby. Richardson, the novelist, was a native of the town. Pop. (1919) 123,930.

DERBY, EARL OF, a title conferred in 1485 on Thomas, second Lord Stanley,

after Bosworth Field, where he and his family had greatly contributed to Richmond's victory. James, seventh Earl of Derby (1606-1651), fought on the royalist side throughout the Great Rebellion, and, taken prisoner after Worcester, was beheaded at Bolton; his countess, Charlotte de la Trémouille, is famous for her heroic defense of Lathom House (1644) and of the Isle of Man (1651).

DERBY, EDWARD GEOFFREY SMITH STANLEY, 14th EARL OF, an English statesman; born in Knowsley Park, Lancashire, March 29, 1799. In 1820 he was elected to the House of Commons as member for Stockbridge. At first inclining to the Whig party he joined Canning's ministry in 1827 and in 1830 became chief secretary for Ireland in Lord Grey's government, greatly distinguishing himself by his speeches in favor of the Reform Bill in 1831-1832. The opposition led by O'Connell in the House of Commons was powerful and violent, but Stanley was successful in totally defeating the agitation for the repeal of the Union. He warmly advocated the abolition of slavery, and passed the act for this purpose in 1833; but in the following year a difference of opinion with his party as to the diversion of the surplus revenues of the Irish Church led him to join the Tories. In 1841 he became colonial secretary under Sir Robert Peel, but resigned on Peel's motion for repeal of the corn-laws. In 1851 and 1858 he formed ministries, and again in 1866. Early in 1868 he resigned office. He died Oct. 23, 1869. **EDWARD HENRY STANLEY**, 15th Earl of Derby, was born in 1826; educated at Rugby, and Trinity College, Cambridge. In 1852 he was under-secretary of foreign affairs; afterward secretary of state for India. Under his superintendence the management of the British India Empire was transferred from the East India Company to the government of Great Britain. In 1866 and also in 1874 he was secretary of state for foreign affairs. Lord Derby became a Liberal in 1879, and was secretary of state for the colonies under Mr. Gladstone from 1882 to 1885. He, however, took a stand against Irish Home Rule in 1886, and afterward ranked among Mr. Gladstone's opponents. He died April 21, 1893.

DERBY, EDWARD GEORGE VILLIERS STANLEY, EARL OF, a British statesman and diplomat. He was born in London in 1865, and was educated at Wellington College. During 1885-1895 he was lieutenant in the Grenadier Guards, acting, 1889-1891, as A. D. C. to the Governor-General of Canada. From 1899 to 1901, during the war with South Africa, he served, first as Chief Press Censor, afterward as private secretary to Lord Roberts (being twice mentioned in despatches). He was one of the Lords of the Treasury during 1895-1900 and from 1900 to 1903 was Financial Secretary to the War Office. From 1903 to 1905 he was Postmaster-General. In 1892 he stood for parliament and was elected member for West Houghton Division of Lancashire, continuing to represent that constituency till 1906. After the World War broke out he became, in 1915, Director-General of Recruiting. In 1916 he became Under-Secretary for War and during 1916-1918 was Secretary of State for War. In 1918 he became Ambassador to France.

DERBY DAY, the name given to two days of the racing season among English-speaking peoples: (1) The day on which the English Derby is run. (2) The grand inauguration day of the summer season at Washington Park, Chicago, on which day the American Derby is run.

DERBYSHIRE NECK, a name given to bronchocele, from its being prevalent in some hilly parts of Derby co., England.

DERBYSHIRE SPAR, also called fluorite, fluor-spar, and bluejohn; is abundant in Derbyshire, and also in Cornwall, England. In the N. of England it is the gangue of the lead mines. It is found in almost every variety of color, red being the rarest.

DERCETO, the Greek name of a Syrian goddess, supposed to be the Dagon of the Philistines.

DERELICT, a vessel or anything relinquished or abandoned at sea, but most commonly applied to a ship abandoned by the crew and left floating about.

DE RESZKE, EDOUARD, a Polish opera singer, born in 1855 at Warsaw. In the early years of his life he studied scientific agriculture and for some time took care of the family estates in Silesia. About 1875 at the suggestion of his older brother he studied voice culture under the eminent masters of his day, and in 1876 made his début in Paris as a basso. During the last decade of the 19th century he was one of the most popular singers in the operas given in New York and London. He died in 1917.

DE RESZKE, JEAN, a dramatic tenor, born in Poland in 1850. His voice attracted attention while he was yet a boy. He studied law and obtained his degree, but chose a singing career in preference to a legal one. After some years of training he made his first appearance at

Venice in 1874, but was physically unequal to the strain of continued singing. For a while he gave up the career he had preferred, but gaining in strength later, he re-entered the profession and for a quarter of a century was one of the most successful and accomplished singers on either side of the Atlantic.

DERG, LOUGH, the largest lake expansion of the river Shannon, between Tipperary and Galway and Clare, in Ireland; is 24 miles long, with an average width of two miles; greatest depth, 80 feet. Its surface is about 100 feet above the sea. Another Lough Derg, in the S. of Donegal co., is 3 miles by 2½, has many small isles and rocks, and wild, dreary shores. Saint's Isle contains the remains of a priory. Station Island, the reputed entrance to St. Patrick's Purgatory, was long the most celebrated place of pilgrimage in Ireland.

DERMATOLOGY, that branch of science which treats of the skin and its diseases. Dr. Aitken gives the following as the more common diseases of the skin: Erythema, urticaria, nettlerash, lichen, psoriasis, herpes, pemphigus or pompholyx, eczema, ecthyma, acne. The parasitic diseases are ringworm, or tinea tonsurans, favus, and itch or scabies. Many of these may appear in combination, or as symptoms of general, constitutional, or febrile diseases; and, in addition to these, having various forms of cutaneous manifestation, are syphilis, purpura, leprosy, scurvy, and the like, with bronzed-skin or ADDISON'S DISEASE (*q. v.*).

DERMATOPHYTE, a parasitic plant infesting the cuticle and epidermis of men and animals, and giving rise to various forms of skin disease, as ringworm, etc.

DERMESTES, a common genus of beetles in the section *Pentamera*, including several species of formidable voracity. The most familiar of these is *D. lardarius*, often called the bacon beetle. In the open air it lives on dead animals; but within doors it attacks bacon, cheese, dried meats, furs, etc. The brown larvæ are equally voracious. Many other species are known on hides and the like.

DERNBURG, BERNHARD, a German diplomat. By gradual promotions he reached the post of Colonial Minister in the Chancellorship of Bülow. The opening of the World War in 1914 found him in the United States where he entered upon a propaganda designed to arouse sympathy for Germany. In this he was fairly successful until the sinking of the Lusitania in May of 1915. He finally became so unpopular that he voluntarily left the United States and returned to Germany. There he exerted his influence to prevent war between the two nations, but the failure of his mission in the United States made his influence on the German Government of no importance. After the Revolution of 1919, Dernburg became a prominent leader of those voters in Germany who wished to prevent the complete capture of the German Government by the Socialists, and yet did not wish for a return of the former Imperial régime. Whether true or not, it was alleged that he and his party, the German People's party, were not hostile to a return to monarchy.

DÉROULÉDE, PAUL (dā-rö-lād'), a French poet; born in Paris, Sept. 2, 1846. His "Soldier Songs" (1872) and "Military Refrains" (1888) were immensely popular, and won him the presidency of the Patriotic League, an association intensely hostile to Germans. In 1900 he was sentenced to 10 years banishment for conspiring against he Republic. The Amnesty Act of 1905 reduced the sentence to five years. He wrote a drama on patriotism, "The Hetman," and the semi-religious drama, "The Moabitess." He died in 1914.

DERRICK, a lifting apparatus consisting of a single post or pole, supported by stays and guys, to which a boom with a pulley or pulleys is attached, used in loading and unloading vessels, etc. Floating derricks of the strongest construction, with an immense boom and numerous blocks, are also used.

DERRICK CRANE, a kind of crane combining the advantages of the common derrick and those of the ordinary crane. The jib of this crane is fitted with a joint at the foot, and has a chain instead of a tension-bar attached to it at the top, so that the inclination, and consequently the sweep, of the crane can be altered at pleasure.

DERVISH, a Mohammedan monk or religious fanatic, who makes a vow of poverty and austerity of life. There are several orders, some living in monasteries, some as hermits, and some as wandering mendicants. Some, called dancing dervishes, are accustomed to spin or whirl themselves round for hours at a time, till they work themselves into a state of frenzy, when they are believed to be inspired.

DERWENT, the name of four rivers in England, in Derbyshire, Yorkshire,

Durham, and Cumberland, respectively, the last draining Derwentwater lake. Also a river in Tasmania.

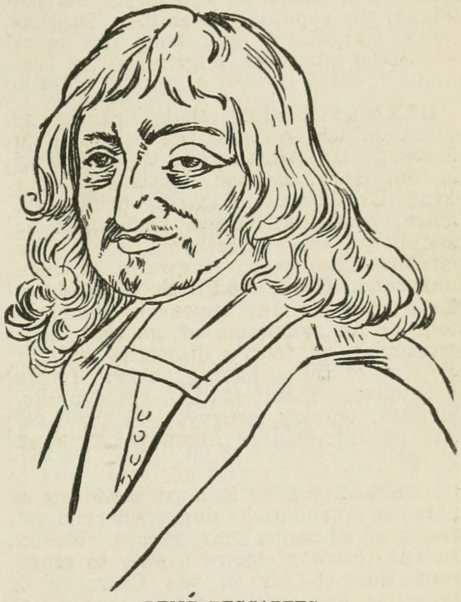
DERWENTWATER, or **KESWICK LAKE**, a beautiful lake in Cumberland, England, in the vale of Keswick. It is about 3 miles in length and 1½ in breadth, and stretches from Skiddaw on the N. to the hills of Borrowdale. Near the N. E. corner is the celebrated cascade of Lodore. Its waters are carried to the sea by the Derwent.

DESAGUADERO ("channel" or "outlet"), the name of various waters in South America, of which the principal is the Rio Desaguadero in Bolivia, emptying its waters into Lake Aullagas. Also a river in the Argentine Confederation flowing into Lake Bevedero Grande, and separating the provinces of San Luis and Mendoza.

DESAIX DE VEYGOUX, LOUIS CHARLES ANTOINE (dēzā' de vā-gö), a French general; born in Auvergne, Aug. 17, 1768. In the early part of the Revolution he became aide-de-camp to General Custine, and was severely wounded at the battle of Lauterberg, but kept the field. Named successively general of brigade and of division, he contributed greatly, by his talents, to the success of the famous retreat of Moreau from Germany. He afterward defended the bridge and fort of Kehl for two months against the Austrian army with great bravery, and was wounded. He served with Bonaparte in Egypt, where he distinguished himself greatly, and was appointed governor of the upper part of the country. He completely subdued Upper Egypt, and received, as a testimony of admiration, from Bonaparte, a sword. He was obliged, however, in 1800, to sign the unfavorable treaty of El Arish with the Turks and English, and on his way to France, was captured by Lord Keith as a prisoner of war. He afterward obtained his parole, and went to France. He once more fought under the banner of Bonaparte in Italy, but was killed at the battle of Marengo, June 14, 1800.

DESCANT, the addition of a part or parts to a tenor or subject. This art, the forerunner of modern counterpoint and harmony, grew out of the still earlier art of diaphony or the organum. It may be said to have come into existence at the end of the 11th or beginning of the 12th century. Originally, as had been previously the case with diaphony, it consisted of two parts only, but later in its life developed into motetts and various other forms of composition. The real difference between diaphony and descant seems to have been that the former was rarely, if ever, more complicated than note against note, whereas descant made use of the various proportionate values of notes. Double descant is where the parts are contrived in such a manner that the treble may be made the bass, and the bass the treble.

DESCARTES, RENÉ (dā-kart'), a French philosopher and mathematician, with whom the modern or new philosophy is often considered as beginning; born in La Haye, in Touraine, March 31, 1596. He was educated at the Jesuit College of La Flèche, where he showed great talent. He entered the military profession and served in Holland and in Bavaria. In 1621 he left the army, and



RENÉ DESCARTES

after a variety of travels finally settled in Holland, and devoted himself to philosophical inquiries. Descartes, seeing the errors and inconsistencies in which other philosophers had involved themselves, determined to build up a system anew for himself, and resolving to accept as true only what could stand the test of reason. There was one thing that he could not doubt or divest himself of the belief of, and that was the existence of himself as a thinking being, and this ultimate certainty he expressed in the celebrated phrase, "Cogito, ergo sum" (I think, therefore I am). Starting from this point, Descartes found the same kind of certainty in such propositions as these: that the thinking being

or soul differs from the body (whose existence consists in space and extension) by its simplicity and immateriality and by the freedom that pertains to it; that every perception of the soul is not distinct; that it is so far an imperfect finite being; that this imperfection of its own leads it to the idea of an absolutely perfect being; and from this last idea he deduces all further knowledge of the truth. Descartes also contributed greatly to the advancement of mathematics and physics. His system of the universe attracted great attention in his time, though long since exploded. His works effected a great revolution in the principles and methods of philosophizing. In 1647 the French court granted him a pension and two years later, on the invitation of Christina of Sweden, he went to Stockholm, where he died, Feb. 11, 1650.

DESCENT, in law, a passing from an ancestor to an heir; a transmission by succession or inheritance. Lineal descent is where property descends directly from father to son, and from son to grandson; where property descends directly from a man to a brother, nephew, or other collateral representative.

DESCENT OF MAN. See DARWINIAN THEORY.

DESCHANEL, PAUL EUGÈNE LOUIS, former President of the French Republic. He was born in 1856 and was educated at the Collège St. Barbe and the Lycée Condorcet, graduating as Licencié ès lettres et en droit. In 1878 he became sub-prefect of Dreux and in the following year general secretary of Seine-et-Marne and sub-prefect of Brest. In 1881 he became sub-prefect of Meaux. In 1885 he was elected deputy to represent Eure-et-Loir in the Chamber of Deputies, and continued as a member of the Chamber, becoming its Vice-President in 1898 and holding that position till 1902. During 1905-1912 he was President of the Commission of Foreign and Colonial Affairs, and during 1906-1912 was Rapporteur of the Budget of Foreign Affairs. In 1919 he was elected President of the Republic, but had to resign, owing to ill health in 1920, being succeeded by Alexandre Millerand. M. Deschanel has won for himself a place in the literary world almost as conspicuous as the place held by him in the public life of France. His works include: "La Politique française en Océanie;" "Les Intérêts français dans l'océan Pacifique;" "Figures de femmes;" Figures littéraires; "La République Nouvelle;" "Paroles françaises;" "Madame de Sévigné;" M. Deschanel was a member of the Académie Française and the Académie des Sciences morales et politiques.

DESEADA, or DÉSIRADE, one of the Leeward Islands, belonging to France, in the Caribbean Sea, about 10 miles long and hardly 5 broad. The soil is in some places black and good, in others sandy and unproductive.

DESERET, the name first adopted by the Mormons for what is now Utah. See MORMONS: UTAH.

DESERT, a term generally used to designate an uninhabited place or solitude. In this sense it is equally applicable to the fertile plains watered by the Marañon, and to the wastes of Libya; but it is applied more particularly to the vast sandy and stony plains of Africa and Asia. The most striking feature of north Africa consists of its immense deserts. Of these the chief is the Sahara, or the Desert, so called by way of pre-eminence. In many parts the dreary waste of loose and hardened sand is broken by low hills of naked sandstone, or by tracts of arid clay, and occasionally it is enlivened by verdant isles, or oases, which serve as resting-places for the caravans that traverse these dismal regions. But for these oases, indeed, the Sahara would be wholly impassable. The great deserts of Africa are separated from those of Asia only by the valley of the River Nile and the Red Sea. Soon after quitting the Nile, the traveler by the route of Suez encounters sand, which is continued into the center of Arabia, where it forms the desert of Nejd, extending to the valley of the Euphrates. The sandy zone then inclines N., enters Persia, and forms the saline deserts of Adjemi, Kerman, and Mekran: it is turned N. E. by the valley of the Indus, passes through Cabul and Little Bokhara, till it joins the vast deserts of Gobi and Shamo, which occupy so large a portion of central Asia between the Altaian and Mustai chains, and reach to the confines of China. The sandy zone, thus traced throughout the breadth of the ancient continent from western Africa to 120° E. longitude, has been computed to cover an area of 6,500,000 square miles; but the Asiatic portion of this tract includes many chains of mountains, and fertile valleys. Except the Nile, the Euphrates, the Indus, and the Oxus, there are no large rivers in a region which embraces almost a fourth part of both Africa and Asia. This portion of central Asia forms a series of elevated plains 6,000 miles in length from E. to W. In the Old Testament

the term desert bears a wholly different interpretation from that usually attached to it in other writings.

DESERTAS, a group of three rocky islets in the Atlantic Ocean, to the S. E. of Madeira, visited at certain seasons of the year by fishermen and herdsmen.

DESICCATION, the evaporation or drying off of the aqueous portion of bodies. It is practiced with fruit, meat, milk, vegetable extracts, and many other matters. It is usually done by a current of heated dry air, and as such may be considered as distinguished from evaporators, so called, to which furnace heat or steam heat is applied.

DESIGN, SCHOOLS OF. Prior to mediæval times every master of a craft and every artist or decorator had in his employ a number of persons who by working on his tasks for small wages learned the secret of his skill. This individual method of instructing beginners disappeared with the use of the craft guilds which laid down the terms for apprenticeship to a trade in very exact measures and from which no master craftsman was allowed to deviate. From 900 to about 1600 this was the only method of instructing beginners in the methods of design. Instruction was, of course, subsidiary to the main purpose of these regulations which was to enhance and protect the profits of the guild members. When about the 15th and 16th centuries great artists such as Raphael and Da Vinci drew about them numerous assistants who wished to learn of them, the guild regulations began to be less effective, and in the case of artists disappeared entirely. But it was not until the founding of the Royal Academy of Fine Arts by Louis XIV. in 1648 that the modern conception of schools of design was embodied. In this school regular instruction was offered to students and prizes offered for the best work in painting, sculpture, engraving, architecture, and work in precious stones and metals. The studio work in the Royal Academy remained on the old apprenticeship basis and in painting and sculpture this still remains both in America and in England. Exceptions to the use of this method in the latter two countries are some of the professional schools in America and the South Kensington Schools in London. In architecture the apprenticeship system has been replaced in America by the architectural schools.

The founding of schools of design was not frequent in Europe until after the expositions of 1851, 1855, and 1865 had shown the superiority of the work of the French artists over those of England and Germany. Then from 1855 to 1880 in England and Germany many schools of design were founded in the great industrial centers, and museums of industrial art were opened which have served to stimulate the work of artists. The United States was slower to accept the lessons taught by the great expositions, for it was not until after the Centennial of 1876 that schools of design were opened. Characteristically their foundation in the States was not due to governments, national, State or municipal, but largely to the benefactions of wealthy patrons. Not until the opening of the 20th century did the governments in the United States take a part in encouraging artists and schools of design, and to a large extent such schools and museums of art are in private hands. Architecture has received the most encouragement of any of the fine arts in America, the schools established by Cornell, Columbia, Harvard, and the Massachusetts Institute of Technology compare favorably with the European schools. Technical instruction in industrial art is very general in America, but as yet schools for those interested in painting and sculpture cannot compare with their European models. Some of the more famous of the schools are the École des Beaux-Arts, National Academy of Design, National Art Schools of South Kensington, Berlin Bau-Akademie, and the Vienna Imperial Art Institue.

DESMAN, an insectivorous mammal of the shrew family. It is 7 inches in length, tail, 8 inches; the feet are webbed, and the flattened tail is covered with scales; the nose is lengthened into a flexible proboscis. It is found in southeastern Russia, making borrows in river banks, beginning under water, and ascending above the level of the highest floods. The food consists of small fishes, frogs, leeches, and larvæ of aquatic insects. The *Mygale Pyrenaica* is not much more than half the size of the Russian species; it is found in France.

DESMIDIACEÆ, a family of confervoid *algæ*, consisting entirely of microscopic flexible organisms inhabiting fresh water, scarcely a specimen of which can be found that does not contain some of them. Sometimes they adhere in large quantities to aquatic plants, forming green films investing these; at others they rest as a thick coating at the bottom of water, or lie intermingled with *confervæ*, etc. The most distinctive feature in their appearance is the bilateral symmetry, indicative of the tendency to divide into two valves or segments. Many of the gen-

era have the power of fixing themselves to external objects, and possess a feeble power of locomotion. Reproduction is effected by (1) cell-division, where each pustule divides into two; (2) by zoöspores; (3) by conjugation. There are five tribes, containing 22 genera.

DESMODIUM, a genus of papilionaceous plants, sub-tribe *Hedysareæ*. The leaves have generally three leaflets; more rarely they are simple. The flowers are in racemes or panicles; the legumes jointed, each joint one-seeded. About 100 species are known, chiefly from South America or from India. *D. gyrans*, an Indian species, is the moving-plant, so called from the rotatory movement of the leaflets. It is sometimes cultivated in greenhouses. *D. diffusum* is a fodder-plant.

DES MOINES, a city, capital of the State of Iowa, and county-seat of Polk co.; at the junction of the Des Moines and Raccoon rivers, and on the Rock Island, the Northwestern, the Burlington Route, the Chicago, Milwaukee and St. Paul, and several other railroads. It is built on a plateau from 15 to 20 feet above the tidewater and is intersected by both rivers, which are spanned by eight bridges. The business portion lies near the rivers, and the residences are on the higher grounds beyond.

Public Parks and Buildings.—The city has an extensive park system. Among the notable buildings are the Capitol, erected at a cost of $3,000,000; the United States Building, containing the Postoffice and Federal Courts; the State Library; the State Historical Building, and Auditorium; Hospitals; Court House; the Grand Opera House; City Hall; State Arsenal; and about 75 churches.

Business Interests.—The city is located in the center of a rich coal mining district. The principal industries, besides coal-mining, include pork-packing and the manufacture of starch, glass, pipe, brick and tile, foundry and machine shop products, engines, boilers, stove pipe, cements, furniture and brass goods. In 1919 there were 3 National banks.

Education.—The school system is maintained at a high standard. The annual expenditure for education is over $1,000,000. For higher instruction there were 5 public high schools, a private one, Des Moines College, Drake University, Highland Park College and Grand View College.

History.—Des Moines was first surveyed in 1846; incorporated as a town in 1853; and chartered as a city in 1857. In the last year it was made the State capital. Pop. (1910) 86,368; (1920) 126,468.

DES MOINES COLLEGE, a coeducational institution in Des Moines, Ia.; founded in 1855; under the auspices of the Baptist Church; reported at the end of 1919: Professors and instructors, 22; students, 550; president, J. A. Earl, D. D.

DES MOINES RIVER, the largest river in Iowa; formed by the E. and W. forks in southwest Minnesota; flows S. S. E. to the capital city, then S. E. to a point about 4 miles below Keokuk, where it empties into the Mississippi river; estimated length, 500 miles. It drains 10,000 square miles in Iowa; flows through a region rich in agricultural and grazing grounds, bituminous coal, and timber; receives the waters of Raccoon, North, Middle, South, and Boone rivers; and with a fall of 8 feet supplies a large number of valuable mill sites along its banks.

DESMOLOGY (a ligament), that branch of anatomy which treats of the ligaments and sinews.

DESMOULINS, BENOIT CAMILLE (dä-mölan), a French revolutionist; born in Guise, Picardy, March 2, 1760. He was among the most notable of the pamphleteers and orators who urged the multitude forward in the path of revolution. He, along with others, prepared the plan for the taking of the Bastille (July, 1789), was one of the founders of the club of Cordeliers, and the promoter of the assembly in the Champ de Mars. In 1793 he gave his vote for the death of the king. Having become closely connected with Danton and the party of opposition to Robespierre, and inveighing against the reign of blood and terror, he was arrested on the order of the latter on March 30, 1794, tried on April 2, and executed on the 5th.

DESNA, a river in Russia, which rises in the government of, and about 50 miles E. of the town of Smolensk, flows through the governments of Orel and Tchernigov till it joins the Dnieper near Kiev. It is 500 miles in length and navigable nearly throughout.

DE SOTO, a city of Missouri, in Jefferson co. It is on the St. Louis, Iron Mountain, and Southern railroad. In the neighborhood are important lead and zinc mines. The city has a large trade in grain, flour, produce, and live stock. Its industries include a shoe factory, flour mills, and railroad machine shops. Pop. (1910) 4,721; (1920) 5,003.

DE SOTO, FERNANDO, a Spanish discoverer; born at Jeres de los Caval-

leros, in Estremadura, about 1496, of a good but impoverished family; accompanied Pedrarias Davila to Darien in 1519; served on the expedition to Nicaragua in 1527; and afterward assisted Pizarro in the conquest of Peru, returning to Spain with a fortune. Charles V. now gave him permission to conquer Florida at his own expense, and appointed him governor of Cuba; and in 1538 he sailed from San Lucar with a richly equipped company. The fleet anchored in the bay of Espiritu Santo (now Tampa Bay) on May 25, 1539; the ships were sent back to Cuba, and the long search for gold was begun. For three years, harassed by Indians and enduring every privation, the company continued the quest. In 1541 the Mississippi was reached and crossed, and the third winter was spent on Washita river. Returning to the Mississippi in the spring, De Soto, worn out by disappointments, died of a fever on its banks, in June, 1542; and that his death might be concealed from the Indians, was lowered at midnight into the waters of the great stream he had discovered. In the following year his companions, reduced to half their original number, sailed down the river, and finally reached the town of Panuco, in Mexico.

DESPENSER, HUGH LE (de-spen'ser), an English jurist; born about 1210. He was justiciar of England in 1261 and during the war of the barons with Henry III. joined the former. He was killed at Evesham, Dec. 4, 1265.

DESPENSER, HUGH LE, an English courtier, grandson of the preceding; born about 1262. He distinguished himself as a soldier and diplomat in the service of Edward II. and became Earl of Winchester in 1322. His tyranny as the royal favorite led to a revolt of the barons and his own downfall. He was beheaded in 1326.

DESPENSER, HUGH LE, an English courtier, son of the preceding; born about 1290. He deserted the baronial party for that of Edward II., and became a royal favorite. He and his father were involved in the misfortunes following the flight of King Edward from London. He was beheaded in November, 1326.

DESPOBLADO (dāz-pō-blä'dō) (desert), a treeless, uninhabited plateau, nearly 10,000 feet above the sea, on the Bolivian and Argentine frontier, N. E. of Antofagasta.

DESPOTO DAGH (des-pō'tō dah), a mountain chain of European Turkey, extending from 30 miles to the E. of the Balkan to the bank of the Maritza.

DESSALINES, JEAN JACQUES (dā-sa-lēn), an emperor of Haiti; born in Africa in 1758. He was a slave in 1791, when the insurrection of the blacks occurred in that island, but was set free along with the other slaves in St. Domingo in 1794. After the deportation of Toussaint L'Ouverture, and the subsequent evacuation of the island by the French, Dessalines was appointed governor-general for life with absolute power; and the year following (1804) was declared emperor with the title of Jacques I. His rule was savage and oppressive, and both the troops and the people entered into a conspiracy against him, and, Oct. 17, 1806, he was slain by one of his soldiers.

DESSAU (des'sou), a town of north Germany; capital of the former Duchy of Anhalt; on the left bank of the Mulde, not far from its junction with the Elbe, 70 miles S. W. of Berlin. It is in general well built. Among the principal buildings are the ducal palace, a notable structure, built in 1748, and improved in 1875, with a valuable picture-gallery and library; a town-hall, an elegant theater, and several churches. The Philanthropinum of Basedow was here. The manufactures are sugar, woolen cloth, machinery, carpets, and there is a large trade in grain. Moses Mendelssohn was a native. Leopold, Prince of Anhalt-Dessau (1676-1747), a famous soldier in the wars of the 18th century, is popularly known as *der alte Dessauer* (the old Dessauer); his statue adorns the market-place. Pop. (1890) 34,658; (1905) 55,134.

DESTERRO (dāz-ter'rō). a seaport of Brazil, capital of the province of Santa Catharina. The harbor is, next to that of Rio de Janeiro, the best on the Brazilian coast.

DESTINN, or DESTINOVA, EMMY. She was born at Prague in 1878, the daughter of Emanuel Kittel. She studied under Madame Loewe Destinn, whose name she assumed when she went on the stage. She sang in various countries of Europe until in 1898 she was engaged at the Royal Opera House, Berlin. The rôles in which she has gained distinction include "Senta," "Mignon," "Carmen," "Santuzza." She has sung in New York and the principal cities of North and South America. She has also written several volumes of poems.

D'ESTOURNELLES DE CONSTANT, BARON (PAUL HENRI BENJAMIN), a French diplomat. He was born at La Flèche, Sarthe, in 1852, and was educated in French schools. He entered politics and was elected a member of the Chamber of Deputies. He represented France

at the two Hague Conferences and was a member of the Hague Court. For eight years he was diplomat at the French Embassy, London, and later became a member of the French Senate. He wrote books on politics, economic science, arbitration, limitation of armaments, and organization of peace. His works include: "Pygmalion," "La politique Française en Tunisie" (crowned by the French Academy), and "Les Etats-Unis d'Amérique."

DESUETUDE, in Scots law, that repeal or revocation of a legal enactment which is effected not by a subsequent contrary enactment, but by the establishment of a contrary use, sanctioned by the lapse of time and the consent of the community.

DETERMINANT, in logic, a mark or attribute added to the subject or predicate, which narrows the extent of both, but renders them more definite, or better determined. In mathematics, a name given to the sum of a series of products of several numbers, these products being formed according to certain specified laws. Thus the determinant of the nine numbers:

$$\begin{matrix} a, & b, & c \\ a', & b', & c' \\ a'', & b'', & c'' \end{matrix}$$

is $ab'c''-ab''c'+a'b''c-a'bc''+a''bc'-a''b'c$.

DETERMINISM, a name applied by Sir W. Hamilton to that system of philosophy which holds that the will is not a free agent, but is irresistibly determined by providential motives, that is, by motives furnished by Providence, which turn the balance in our mental deliberations in accordance with its views.

DETMOLD, capital of the former German Principality of Lippe, on the Werre, 47 miles S. W. of Hanover. The chief buildings are the old castle, the modern palace, and the theater. Detmold has also a museum, a public library, a hospital, a gymnasium, and several other schools. There are manufactures of tobacco, cards, and carved work in wood and stone, as well as several breweries. On a hill two miles from Detmold is a colossal statue of Arminius.

DETONATING POWDERS, certain chemical compounds, which, on being exposed to heat or suddenly struck, explode with a loud report, owing to one or more of the constituent parts suddenly assuming the gaseous state. The chloride and iodide of nitrogen are very powerful detonating substances.

DETONATING TUBE, a species of eudiometer, being a stout glass tube used in chemical analysis for detonating gaseous bodies. It is generally graduated into centesimal parts, and perforated by two opposed wires for the purpose of passing an electric spark through the gases which are introduced into it, and which are confined within it over mercury and water.

DETRITUS, applied in geology to accumulations formed by the disintegration of rocks, may consist of angular and subangular debris, or of more or less waterworn materials, such as gravel, sand, or clay, or an admixture of these.

DETROIT, the largest city of Michigan, and the county-seat of Wayne co. It is on the Detroit river, along which it extends for about 12 miles. It is also on the shores of Lake St. Clair. The city has an area of about 94 square miles, and is beautifully situated on ground which rises from the river. The great bodies of water adjacent to the city tend to moderate climatic conditions, and its elevation of 576 feet above sea-level has much to do with the very high average of health conditions in the city and its surroundings. The city, both commercially and industrially, is one of the most important in the United States. It is on the lines of the Canadian Pacific, the Grand Trunk, the Lake Shore and Michigan Southern, the Pere Marquette, the Wabash, the Michigan Central, and other railroads. Its industries are widely diversified. There were in 1920 over 3,100 different classes hundreds of commodities of world-wide uses. It stands prominently among the cities of the United States in the production of automobiles, adding machines, soda and alkali products, stoves, steamships, gas engines, aeroplanes, hydraulic hoists, automobile parts, varnishes, paints, and oils, drugs, and pharmaceutical products. Wholesale and jobbing interests also play an important part in the business life of the city. The Detroit river carries an immense freight traffic. Nearly 40,000 vessels yearly, carrying a total tonnage of approximately 100,000,000 tons, valued at more than a billion and a quarter dollars, pass before the city.

Detroit had in 1920 14 State banks, 5 National banks, 6 trust companies, and a Federal Reserve bank, with aggregate resources in the neighborhood of a half billion dollars. The total capital, surplus and undivided profits of the banks aggregated $50,000,000, and the total deposits amounted to nearly $425,000,000. The exchanges in the clearing house for the year ending Sept. 30, 1919, amounted to $4,032,443,000. Several of the largest manufacturers of automobiles have their plants in Detroit. These include the Ford Company, Packard Motor

Car Company, the Hudson Company, the Paige-Detroit Company, and others. During the war the city developed a great shipbuilding industry which has been continued and vessels are made not only for inland waters but for ocean travel.

There are over 700 miles of streets, the greater part of which are paved. The principal streets are laid with brick or asphalt. The streets in general cross at right angles, but these are intersected by several broad avenues radiating from the Grand Circus, a semi-circular park of 5½ acres in the center of the city. Woodward Avenue, extending through this, divides the city into nearly equal portions. There is an attractive system of parks, including an island park known as Belle Isle. This contains 707 acres, and lies in the center of the Detroit river, about 3 miles from the heart of the city. There are many handsome public buildings, including the Wayne County Court House, the City Hall, Post-office, and Detroit Athletic Club House, and the Y. M. C. A. building and several hospitals. Many of the churches are also notable for the beauty of their architecture. The Museum of Art contains a library and valuable collections of classical art, modern paintings, furniture, etc.

The educational system is maintained according to the highest modern standards. There are 160 public and 75 private schools, including 10 high schools, and 4 junior high schools. In connection with the school system are operated three college units, including a medical school, a normal school, and a junior college. These eventually will comprise the University of the City of Detroit. In addition to the public schools there are 60 parochial schools and numerous private institutions. The city spends approximately $6,000,000 to maintain this school system.

The city is notable for a large number of handsome business buildings, hotels and theaters.

Detroit was founded by the French explorer Cadillac, in 1701. After the site was chosen, a palisade inclosure was erected and called Fort Pontchartrain. The name Detroit is after the French "d'étroit" meaning the strait, and was so called because of its situation on the narrow strait now known as Detroit river, connecting Lake St. Clair with Lake Erie. The French ruled the region until 1760, when they were superseded by the English, who in turn held it until 1796, when it was conquered by General Wayne. The English again assumed control in 1813, but Commodore Perry's victory of Lake Erie gave the entire territory to the United States. The city has shown a remarkable increase in population in recent years. The figures are as follows: (1900) 285,705; (1910) 465,766; (1920) 993,678.

DETROIT RIVER, or **STRAIT of ST. CLAIR**, a river or strait of North America, which runs from Lake St. Clair to Lake Erie. It is 28 miles long, and of sufficient depth for the navigation of large vessels. It is about three-fourths of a mile wide opposite Detroit and enlarges as it descends.

DETTINGEN (det'ting-en), a village of Bavaria, on the Main, 10 miles N. W. of Aschaffenburg; is noted as the scene of a battle during the war of the Austrian Succession, when, on June 27, 1743, George II. of England, commanding English, Hanoverians, and Austrians, defeated the larger French army under the Duc de Noailles. This was the last time a king of England took the field in person.

DEUCALION (dü-ka'li-un), the son of Prometheus and Clymere. Zeus having resolved to destroy the human race by a deluge, Deucalion built a ship, in which he and his wife, Pyrrha, escaped. When the ship finally rested on Mount Ætna, they resolved to offer up sacrifices to the gods for the repeopling of the world; thereupon, they went to the sanctuary of Themis for this purpose, and were told by the goddess that they must throw behind them the bones of their mother as they departed from the temple. Understanding by the "bones of their mother" the stones of the earth, they obeyed the injunction, and from those thrown by Deucalion sprang up men, and from those by Pyrrha women. Deucalion built his first dwelling place at Opus, or Cynus. He is also said to have founded the sanctuary of Olympian Jove at Athens, and in later ages his tomb in the vicinity was long pointed out. Deucalion had by Pyrrha several children, Hellen, Amphictyon, Protogeneia, and others.

DEUTERONOMY (Gr. *deuteronomion*, the "second" or "repeated law"), the Greek name of the fifth book of the Pentateuch. It presents the third and latest phase of the development of the Mosaic legislation. Its great aim is to check the encroachments of idolatry, and to concentrate the national worship in the great sanctuary at Jerusalem, especially at the three annual festivals. It is instinct with the prophetic spirit, and lays stress on the great commandment to love and fear God with the whole heart as the sum of the whole law.

DEUTZIA (named after John Deutz, a Dutch naturalist), a genus of shrubs, natives of the East Indies, belonging to the natural order *Philadelphaceæ*, or syringas. The leaves are used in Japan for polishing purposes, and their inner bark for poultices.

DE VALERA, EAMON, President of the "Irish Republic." He was born in New York in 1882, the son of a Spanish artist (Vivión De Valera), and an Irish mother (Catherine Coll). His father died before the son was three years old and the boy was taken to Ireland to be cared for by his maternal grandmother. He received his education in the school of Bruree, Limerick. He entered Blackrock College, Dublin, and after receiving his degree, taught mathematics at Rockwell College, Cashel. He taught at Maynooth Seminary and at Carysport Normal College, Dublin. He became a member of the Gaelic League, and participated in the Gaelic revival. De Valera was prominent among the organizers of the Irish Volunteers in 1913, and when the insurrection against British rule broke out in Ireland during Easter week, 1916, he commanded, with Padraic Pearse, the battalion which held the Dublin post-office and was the last to lay down his arms. On the proclamation of the Irish Republic by the members of the Dail Eireann, assembled in Dublin, De Valera was elected President to succeed Padraic Pearse, who had been executed. He was imprisoned several times and was sentenced to death in 1916. In 1919 he escaped from his prison in England and came to America, where during 1919 and 1920 he toured the country, making speeches. In September, 1920, he replied to Lord Grey's proposal of dominion home rule by declaring that the Irish people had established a republic and would be content with nothing short of absolute independence.

DEVA'S VALE, the valley of the Dee (or Deva) in Cheshire, England.

"He chose a farm in Deva's vale,
Where his long alleys peeped upon the main."
—Thomson's "Castle of Indolence."

DEVELOPMENT, the gradual advance, stage by stage, of animal or vegetable bodies from the embryonic to the perfect state.

DEVENTER, a city of Holland, at the junction of the Schepbeek and Yssel rivers. There are several important and interesting mediæval buildings, including an early Gothic church, a town hall, and a court house. The industries include carpet and rug factories. There are also manufactures of iron, cigars, rope, and cotton. The city has a large trade in grain and live stock. Pop. about 30,000.

DE VERE, SIR AUBREY, an Irish poet; born in Currah Chase, Aug. 28, 1788. His works are: "Julian the Apostate; a Dramatic Poem" (1822); "The Duke of Mercia: a Historical Drama," the volume containing also "The Lamentations of Ireland" (1823); "The Song of Faith," (1842); and "Mary Tudor: a Historical Drama" (1847). His sonnets Wordsworth declared to be "the most perfect of our age." He died July 5, 1846.

DEVI (dā'vē), in Hindu mythology, "the goddess," or Mahadevi "the great goddess," wife of the god Shiva and daughter of Himavit (that is, the Himalaya Mountains) She is represented as being of two characters, one gentle, the other fierce, and it is under the latter aspect that she is generally worshipped.

DEVIL, or **SATAN**, names applied in the New Testament and in Christian theology to the supreme impersonation of evil, considered as possessing an objective existence outside of man, and placed at the head of a host of inferior evil spirits, whose continual occupation is to thwart the good purpose of God and the progress of His kingdom in the hearts of men. It seems certain that this conception was foreign to the early Jewish mind, with its strong grasp of the monotheistic idea in the person of the supreme Jehovah. It is Jehovah Himself who hardens Pharaoh's heart, and sends a lying spirit among the prophets of Ahab, and it is He who is considered as the sole source of all power, the sender of pestilence and death as well as blessings. In the exegesis of later days the serpent that tempted Eve in Eden, and the "Old Serpent" of the Apocalypse, were alike identified with Satan, though this interpretation certainly gains no support from the story in Genesis, where the tempter is as yet hardly more than a mere animal, though one of a family almost everywhere specially associated with evil.

It is significant that the name Satan occurs but five times in the Old Testament: thrice in Job, where he represents himself among the "sons of God" (Beni Elohim) before the Lord.

The Jews had also their demonology like all primitive peoples, as may be seen in the seirim (satyrs, lit. "he-goats") and the shedim, both rendered by "devils" in the authorized version, and perhaps also in the Azazel of Leviticus xvi.; but it was not till later that a special angel became differentiated from

his brethren in the heavenly court, with the special function of the accuser of men, like the personification of a guilty conscience. In the vision of Zechariah we find him considered formally as the accuser of Israel. Undoubtedly also this conception had already become greatly modified during the period of exile by contact with Persian dualism. Of course such a conception as Ahriman, the mighty author of evil and the antagonist almost on equal terms of Ormuzd, was completely foreign to Jewish monotheism, yet the Jewish Satan grew greatly both in definiteness and in power under his shadow, and henceforth it is from him directly that moral and physical harm toward men proceeds.

Persian influence appears most plainly in the apocryphal books of Tobit and Baruch, but the growth of the conception of the devil is seen also in the translation of the LXX., which renders his name by diabolos, thus emphasizing and perpetuating his special function as the accuser. Now also he becomes located in his gloomy kingdom of hell, and is attended by troops of inferior fiends. He wages warfare on mankind by inflicting physical and moral evil, and is considered as the agent by whose means man fell from his original state of innocence.

In the New Testament the conception of the personality of the devil and of a kingdom of demons holds its ground, but the whole subject is here treated with a kind of spiritual reserve, in a teaching that emphasizes our own hearts and their inward temptations as the source of our evil thoughts and deeds, and connects moral evil inseparably with the earthly nature of man. The passages which speak of a fall of angelic beings (II Peter ii: 4; Jude 6) occur in scriptures of subordinate canonical rank; Jesus nowhere defines concretely the function of the devil; and the few positive statements about him—that "he was a murderer from the beginning, and stood not in the truth," that "he is a liar" (John viii: 44), and "sinneth from the beginning" (John iii: 8), scarcely furnish a sufficient foundation for a complete doctrine on this subject. Yet the impressive manner in which it is dwelt on by our Lord and His apostles shows that it is a necessary part of Christian teaching.

The early theologians were more literal and less spiritual in their conceptions, and in their horror of heathen institutions came to identify the kingdom of the devil in a particular manner with polytheism and the persecution they suffered under the Roman empire. Thus the devil again became a kind of rival of God, wholly unequal but yet formidable. The early Christians considered the gods of heathenism as indeed conquered by Christ, but yet not rendered wholly powerless, for as degraded demons and with intent to deceive they uttered oracles, and were present at sacrifices, inhaling the sacrificial incense—an idea in perfect harmony with the growing materialistic conception of the devils, and of hell their residence, a place blazing with eternal fire, and filled with every horror the imagination could suggest.

Exaggerated ideas of the devil's dangerous power prevailed throughout the Dark and Middle Ages, whose deep, melancholy faith and fantastic theory of the universe generated saints naturally on the one hand and witches and sorcerers as naturally on the other. It was an involuntary exercise of the poetic faculty, through which the thoughts of their own hearts and of their own time became spirits, which they saw around them. Throughout the Middle Ages the devil was an absorbing idea, and the constant familiarity with him often brought with it a penalty of contempt. In the old religious plays a principal part was usually assigned to him, and indeed he principally represented the comic element, as may still be seen in the pastorales of the Basques.

The decadence of belief in the active external power of the devil was mainly due to the indirect effect of the Reformation and the progress of science. To no man was the devil ever more present than to Luther, but nevertheless it was mainly the movement he inaugurated that has driven the enemy back into the sphere of the abstract and the ideal. In later generations the sense of the supernatural has steadily decayed, and with it almost all the terrors of the devil; but it cannot be said that with it has also disappeared a genuine religious spirit. The Christian man in the conscious weakness of his struggle against indwelling sin feels that he has no need to conjure up for himself an external suggester of temptation—he has devil enough in the treacherous inclinations of his own heart.

Kant (in 1793) defined the devil as the personification of "radical evil." Schleiermacher held that symbolic reference to the devil might fitly have a place in Christian discourse, but denied the possibility of his real existence, and in this he has been followed by Schenkel, Biedermann, Lipsius, Pfleiderer, and others. On the other hand the orthodox view is maintained more or less definitely by Lücke, Von Hofmann, Luthardt, Rothe, Julius Müller, Martensen, and Dorner, who hold that though the doctrine can-

not be completely constructed, it yet forms part of a consistent whole, and is of importance for the Christian as distinguished from the heathen and Jewish conception of evil, as well as for the Christian life.

DEVILFISH, the popular name of various fishes, one of them being the angler. Among others the name is given to several large species of ray occasionally captured on the Atlantic and Pacific coasts of America, and much dreaded by divers, whom they are said to devour after enveloping them in their vast wings.

DEVIL'S ISLAND (Isle du Diable), a small rock formation off the coast of French Guiana, belonging to France. The area is about 16 square miles, and the island itself is sandy, dry, and torrid. Here Capt. ALFRED DREYFUS (*q. v.*) was imprisoned for alleged treason.

DEVIL'S LAKE, a city of North Dakota, the county-seat of Ramsey co. It is on the Great Northern and the Farmers' Grain and Shipping Company's railroads, and on Devil's Lake. The industries include creameries and flour mills. The city has a school for the deaf, a public park, St. Mary's Academy, and a general hospital. Pop. (1910) 5,157; (1920) 5,140.

DEVIL'S PUNCH-BOWL, a small lake of Ireland, near the lakes of Killarney, between 2,000 and 3,000 feet above the sea, supposed to be the crater of an ancient volcano.

DEVIL'S WALL, in the S. of Germany, a structure which was originally a Roman rampart, intended to protect the Roman settlements on the left bank of the Danube and on the right bank of the Rhine, against the inroads of the Teutonic and other tribes. Remains of it are found from the Danube, in Bavaria, to Bonn on the Rhine.

DEVINE, EDWARD THOMAS, an American author and lecturer; born in Union, Ia., in 1867. He graduated from Cornell College, Iowa, in 1887, and took post-graduate courses in the United States and in Germany. He was principal of schools in Iowa for several years, and from 1891 to 1896 was staff lecturer on economics for the American Society for the Extension of University Teaching. He was secretary of the same organization from 1894 to 1896, and from 1896 to 1912 was general secretary of the Charity Organization Society of New York. He was editor of the "Survey" from 1897 to 1912. From 1905 to 1919 he was professor of social economy at Columbia University and was director of the New York School of Philanthropy from 1904 to 1907. In 1917 and 1918 he was chief of the Bureau of Refugees and Home Relief under the American Red Cross Commission in France. He represented and directed several Red Cross relief expeditions, including San Francisco in 1906 and Dayton, O., in 1913. He was a member of many economic and educational societies. He wrote "Economics" (1899); "The Practice of Charity" (1901); "Social Forces" (1909); "The Normal Life" (1915); "Disabled Soldiers and Sailors" (1919).

DE VINNE, THEODORE LOW, an American printer; born in Stamford, Conn., Dec. 25, 1828. He learned the printer's trade and became an employe and later partner of Francis Hart, upon whose death he founded the firm of Theodore L. De Vinne & Co. in New York City. He wrote "The Practice of Typography" (1900); "Title Pages" (1902); "Notable Printers of Italy in the 15th Century" (1910). He died in 1914.

DEVONIAN SYSTEM, a name in geology originally given to the rocks of Devonshire and Cornwall, England. This name was proposed by Murchison and Sedgwick to replace the more characteristic and older term of Old Red Sandstone (a fresh water deposit), because the slaty and calciferous strata in Devonshire contain a much more copious and rich fossil fauna than the red arenaceous rocks of Scotland, Wales, and Herefordshire, with which they are believed to be contemporaneous. The fossils of the lacustrine Old Red Sandstone are chiefly fishes which have been classed as *Ganoids*. Professor Huxley approximates them to the *Siluridæ;* but investigations in progress in 1900, it is believed, will assign many of them to the lung fishes, represented in modern waters by *Ceratodus* and *Lepidosiren*, and others not represented in the waters of the modern world. The fossils of the marine Devonians are largely corals such as *Favosites* and *Cyathophyllum*, with brachiopod shells and skeletal parts of other organisms.

The physical condition under which the marine sediments in Devonshire were deposited differed greatly from that which marked the accumulation of the Old Red Sandstone and has caused some doubts as to the correlation of the two sets of strata. British geologists retain both names, the Devonian System and Old Red Sandstone System; in the United States the term Devonian is used almost exclusively. The strata intermediate between the Silurian and Carboniferous consist of sandstones of different colors,

calcareous slates, limestones, etc. They are divided into the Lower, Middle, and Upper Groups, all containing fossils; but in the middle division, corresponding practically to the Hamilton of New York, organic remains are especially abundant and include corals, crinoids, brachiopods, mollusks, and crustaceans.

Devonian rocks occupy a large area in central Europe, as well as in the United States, eastern Canada, and Nova Scotia. In the United States they are found in New York and Pennsylvania, and include sand and limestone, used as building material, and are classed under the names of Oriskany, the oldest term, Corniferous or Upper Helderberg, Hamilton, and Chemung. Devonian rocks appear in some regions of the Appalachian Mountains. In the middle part of Michigan they surround the coal basin; and they are also found in Kentucky, Indiana, Ohio, Illinois, eastern Iowa, and Nevada. In Maine they are in a metamorphic condition. In the Upper Groups of the Devonian System there are carbonaceous shales, which by mutual distillation give much of the petroleum and natural gas found in the sandstones of Pennsylvania and eastern Ohio.

DEVONPORT (before 1824 called PLYMOUTH DOCK), a parliamentary and municipal borough, maritime town, and naval arsenal, in the S. W. of Devonshire, England; on the E. shore of the estuary of the Tamar, two miles W. N. W. of Plymouth. It stands on high ground, and is separated from its suburbs of Stoke and Morice Town by the glacis of its fortifications, once important, but now dismantled. The streets are regular, and the footpaths of marble. Devonport is supplied with water from Dartmoor by a circuitous route of 30 miles. It owes its existence to the dockyard established here by William III. in 1689, and is one of the chief naval arsenals in Great Britain. Pop. about 85,000.

DEVONSHIRE, a county of England in the S. W. part. It has an area of 2,604.9 square miles, of which three-fourths are pasture land, or cultivated area. The north coast is steep and rocky. The south coast is lined with cliffs and indented with several bays. The general surface of the county is hilly. There are important agricultural industries and also considerable mining, manufacturing, and fishing. The chief cities are Exeter, the county town, Plymouth and Barnstaple. Population, about 460,000.

DE VRIES, HUGO, a Dutch botanist, born in 1848 at Harlem. He was educated at Leyden and German universities, and in 1871 joined the staff of the University of Amsterdam as a lecturer. He afterward became professor of botany at that institution. He devoted special attention to the development of the theory of mutation and made important contributions to that branch of evolutionary science. His researches resulted in a change of the method of studying evolution from observation to experimental work. He wrote several books, including "Plant Breeding" (1907).

DEW, a deposition of water from the atmosphere on the surface of the earth in the form of minute globules. During the day the earth both absorbs and emits heat, but after sunset its supply of warmth is cut off, while it still continues to radiate heat into the surrounding space. Grass, flowers, and foliage being good radiators, lose after sunset the heat which has previously been absorbed by them, without receiving any in return, and their temperature consequently falls considerably below that of the atmosphere. From the proximity of these cold substances the particles of vapor in the adjoining air are condensed and deposited on their surfaces in the form of dew, or of hoar-frost where the temperature of the earth is below 32°. When the sky is clouded the heat abstracted from the earth's surface by radiation is restored by the clouds, which, being good radiators, send back an amount of heat equal to what they receive; and a balance of temperature being thus maintained between the earth and the surrounding atmosphere, no dew is formed.

Horizontal surfaces, and those which are exposed to a wide expanse of sky, receive a greater supply of dew than sheltered or oblique surfaces, where circumstances diminish the amount of radiation. The radiation from the earth's surface is one of these happy provisions for the necessities of living beings with which nature everywhere abounds. The heavy dews which fall in tropical regions are in the highest degree beneficial to vegetation, which, but for this supply of moisture, would, in countries where scarcely any rain falls for months, be soon scorched and withered. In cold climates the earth, being cold and sufficiently moist, requires little dew; accordingly the clouds, which are so common in damp and chilly regions, prevent the radiation of heat; the surface is thus preserved warm, and the deposition of dew is, in a great measure, prevented.

DEWAR, SIR JAMES, a British scientist. He was born in Scotland in 1842, and was educated at Dollar Academy and Edinburgh University. He became assistant to Lord Playfair when Professor of Chemistry at Edinburgh

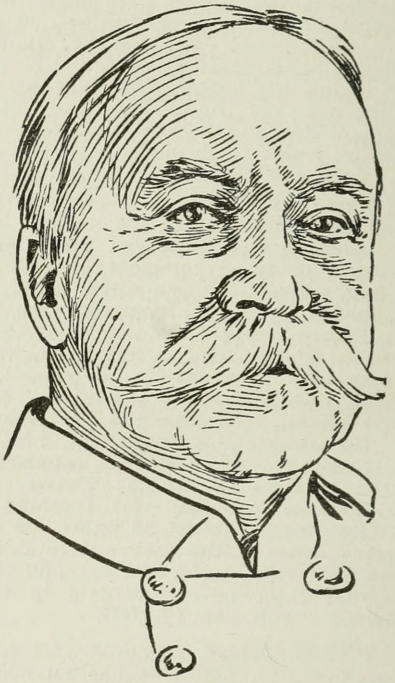
University and became president of the Chemical Society in 1897. He has made many discoveries in chemistry and has been a member of the Government Explosive Committee. He was awarded the Rumford Medal of the Royal Society, 1894, and has received medals from scientific societies in many countries. He is F.R.S.; M.A.; LL.D., and president of the British Association. His literary works include: "Collected Papers on Spectroscopy," numerous papers contributed to the proceedings of the Royal Societies of London and Edinburgh, the Royal Institution, the British Association, the Chemical Society, etc.

DEWAS, a native state of central India under British protection, held conjointly by two Rajput chiefs. Area under both chiefs, 290 square miles; pop. 152,100. The capital, Dewas, 20 miles N. E. of Indore, is a straggling town, with a population of about 12,000.

DEWBERRY (*Rubus cæsius*), a plant distinguished from the common bramble by its weaker and more prostrate glaucous stem, with scattered prickles, but without bristles, also by the few large drupes, which make up its fruit, and which have a characteristic dew-like bloom, whence the name arises. The fruit is very sweet and agreeable, and makes an excellent wine. The dewberry of North America (*R. procumbens*), abundant in the forests of Canada, is a delicious fruit.

DE WET, CHRISTIAN, a Boer military officer; born in Smithfield, Orange Free State (now Orange River State), in October, 1859. He was bred a farmer and made a small fortune. He became a member of the Volksraad. Though practically without military experience, he served ably in the Boer-British War of 1899-1900, attaining the rank of general and outwitting the pursuit of Kitchener and Roberts in the summer of 1900, and of the former in the early part of 1901. His stand at Sanna's Post was highly praised by military experts. In 1907 he was a member of the first Parliament of the Orange River Colony and Minister of Agriculture. In October, 1914, he led an insurrection and surrendered to General Louis Botha on Dec. 2, 1914. He was sentenced to six years' imprisonment and to pay a fine of $10,000, but within a short time was pardoned. He published "Three Years of War" (1902).

DEWEY, GEORGE, an American naval officer; born in Montpelier, Vt., Dec. 26, 1837. He came of New England stock, his father being Dr. Julius Y. Dewey, one of the first authorities on life insurance in his day. At the age of 17, after a preparatory course in the Northfield Military School, young Dewey was appointed a cadet at Annapolis, in the class which graduated in 1858. A practice cruise on the "Wabash" followed, and he was resting at home when the Civil War broke out. At once he was commissioned a lieutenant and assigned to the "Mississippi," a 17-gun steam-sloop of the old side-wheel type, under Commander Melanchthon Smith. His first serious taste of war was when the West Gulf squadron, early in 1862, forced a passage up the Mississippi river ahead of Farragut. A later enterprise resulted in the grounding of the "Mississippi," in the middle of the night, while attempting to run the batteries of Port Hudson. Here she was riddled with



ADMIRAL DEWEY

shot and set afire by the enemy's batteries, so that officers and crew had to abandon her.

Other notable engagements in which Dewey figured during the Civil War were at Donaldsonville in 1863, where he was on one of the gunboats, and at Fort Fisher in the winter of 1864-1865, as an officer of the "Agawam." Receiving his commission as lieutenant-commander in March, 1865, he served for two years on the "Kearsarge" and the "Colorado," and was then attached to the Naval

Academy for two years more. In 1870 he was given command of the "Narragansett," and during his five years' charge of her rose to be a commander. He was then attached to the Lighthouse Board, and in 1882 took his next sea duty in command of the "Juniata," of the Asiatic squadron. On reaching his captaincy, in 1884, he took charge of the "Dolphin," one of the first vessels of the "new navy." From 1885 to 1888 he commanded the "Pensacola," then flagship of the European squadron. Ashore he served as chief of the Bureau of Equipment at the Navy Department, and afterward on the Lighthouse Board for a second time. In 1896 he was promoted to commodore, and made head of the inspection board; and at the beginning of 1898 was given command of the Asiatic squadron.

With his squadron he left Mirs Bay, China, April 27, 1898, with orders to "capture or destroy the Spanish squadron," which was then supposed to be in Manila Bay, under command of Admiral Montojo. The squadron entered the channel of Manila at 11:30 P. M., Saturday, April 30, and early on Sunday morning, May 1, sank, burned or captured all the ships of the Spanish squadron in the bay, silenced and destroyed three land batteries, obtained complete control of the bay, without losing a single man. In recognition of this achievement, Commodore Dewey received the thanks of Congress, which awarded to him a magnificent sword, and medals to his men. On May 7, 1898, he was promoted to be a rear-admiral, and subsequently (March 3, 1899) was made Admiral of the Navy under an act of Congress, approved March 2, 1899, restoring that rank. In 1901 he was president of the Court of Inquiry which was appointed at the request of Rear-Admiral Schley, and in the same year was appointed President of the Navy Board, which position he held until his death, Jan. 16, 1917.

DEWEY, JOHN, an American educator, born in Burlington, Vt., in 1859. He graduated from the University of Vermont in 1879 and took post-graduate studies at Johns Hopkins University. He was on the faculty of the University of Minnesota as professor of philosophy in 1888-1889, and at the University of Michigan from 1889 to 1894. From 1894 to 1904 he was professor and head of the department of philosophy at the University of Chicago and was director of the School of Education at that institution from 1902 to 1904. From 1904 he was professor of philosophy at Columbia University, at the same time acting as lecturer on psychology. He was president of the American Psychological Association, and the American Philosophical Society. He wrote many works on philosophy and psychology, including "School and Society" (1899); "Studies in Logical Theory" (1903); "How to Think" (1909); "German Philosophy and Politics" (1915); and "Democracy and Education" (1916).

DEWEY, MELVIL, an American librarian, born at Adams Center, N. Y., in 1851. He graduated from Amherst College in 1874. After serving as librarian at Amherst College, he became chief librarian and professor of library economy at Columbia University. From 1889 to 1906 he was director of the New York State Library, and from 1891 to 1906 he was director of the Home Education Department. He was secretary and executive officer of the University of the State of New York from 1889 to 1900, and from 1904 to 1906 was State director of libraries in New York. He was one of the chief advocates of spelling reform, and was editor of the "A. L. A. Catalog" (1904); and "The Library"; and of various journals and reports. He was a member and officer of many educational societies.

DEWING, THOMAS WILMER, an American artist, born in Boston in 1851. He studied art in Paris and in 1879 began the practice of his profession in New York City, painting chiefly portraits and figure compositions. He was awarded the Clarke prize in 1887, and the first medal at the Carnegie Institute in 1908. He was a member of the National Academy of Design.

DEXTER, in heraldry the right; situated on the right; as the dexter side of a shield is that opposite the left hand of the spectator.

DEXTER, HENRY an American news agent; born in West Cambridge, Mass., March 14, 1813. He was educated in the common schools, and, after obtaining employment in various publishing houses, started for himself in 1842 as a news agent. In 1864 he organized the American News Co. He died July 11, 1910.

DEXTRIN, or **DEXTRINE**, in chemistry, $C_6H_{10}O_6$, starch gum, British gum; obtained by the action of boiling dilute sulphuric acid on starch, and afterward neutralizing with chalk; if boiled for a longer time the dextrin is converted into dextrose. Dextrin can also be formed by heating starch to between 170° to 200° C. It is a gummy amorphous mass, soluble in water, and precipitated by alcohol. It is called dextrin on account of its dextro-rotary action on polarized light. Dextrin is formed in germinating seeds

by the action of an azotized substance called diastase. Dextrin is used as a substitute for gum.

DEXTROSE, grape sugar, dextroglucose, $C_6H_{12}O_6$ or $C_6H_7O(OH)_5$. Dextrose occurs along with levulose in grapes and other sweet fruits, also in honey and in the urine of diabetic patients. It can be produced by the action of dilute sulphuric acid on cane sugar, starch, cellulose, etc. It can be best obtained by boiling for several hours 50 parts of starch with dilute sulphuric acid (100 parts of water to five parts of H_2SO_4). The solution is then neutralized with chalk, filtered, boiled with animal charcoal to remove traces of color, and then evaporated carefully to dryness, forming an amorphous mass which contains about 60 per cent. of dextrose, the remainder being chiefly dextrin. Pure dextrose can be obtained by crystallization from alcohol. It turns polarized light to the right, and dissolves lime, baryta, oxide of lead, etc.

Dextrose reduces an alkaline solution of cupric sulphate, giving a red precipitate of Cu_2O on heating. It reduces ferric salts to ferrous salts. Dextrose tastes much less sweet than ordinary cane sugar. By the action of sodium amalgam on dextrose it is converted into mannite, $C_6H_{14}O_6$.

DEY, a title formerly assumed by the rulers (under the Turkish Sultan) of Algiers, Tripoli, and Tunis. The name was also formerly given to elderly people, especially among the Janizaries; hence came to be commonly applied at Algiers to the commanding officers of that corps, who frequently became afterward a pasha or regent of that province.

DHALAK (dha-lak'), an archipelago of the Red Sea, off the coast of Abyssinia. It contains nearly 100 rocks and islets, mostly uninhabited, clustering round the island of Dhalak el-Kebir, which is about 35 miles long by 30 broad. This island possesses a pearl fishery.

DHAR, a town of central India, lying at an elevation of 1,908 feet above the sea, 33 miles W. of Mhov. It has over 20,000 inhabitants, and preserves, in two large mosques of red stone and a fort defended by a high rampart and 26 towers, traces of bygone magnificence. It is the capital of a protected state of the same name, with an area of 1,775 square miles, and a population of about 145,000.

DHARWAR, a town and district in the southern Mahratta country, in Bombay presidency, separated by the river Tungabhadra from Madras. The town has no manufactures of importance, but a good deal of trade. Pop. 30,000. The district has an area of 4,600 square miles, and a population of 1,100,000, mostly Hindus. The most interesting feature of the country is its suitableness for the growth of American cotton, which now occupies a third of the total acreage devoted to cotton. Cotton and silk cloth are manufactured in the district. The prevalent language is Canarese.

DHOLPORE, a native state of Rajputana, in central India, on the N. bank of the Chumbul, with an area of 1,200 square miles, and a population of 280,000, mostly Hindus. Capital, Dholpore, on the Chumbul, 34 miles S. of Agra. A large 15 days' fair is held every year at Machkund, a lake 3 miles to the W., with no fewer than 114 temples on its banks.

DHOW (dou), an Arab sea-going vessel, ranging from a comparatively small size up to 250 tons burden, with one mast and a large, square sail. It is used for merchandise and is often employed in carrying slaves from the E. coast of Africa to Arabia.

DHURRA, or **DOURAH**, Indian millet, the seed of *Sorghum vulgare*, after wheat the chief cereal crop of the Mediterranean region, and largely used in those countries by the laboring classes for food. Varieties are grown in many parts of Africa, one of them known as Kaffir corn.

DHWALAGIRI (dwä-lä-gē'rē), once supposed to be the highest peak of the Himalayas, but now ascertained to be at most only the third in point of altitude, has a height of 26,826 feet above the sea. It is in Nepal, in lat. 29° N., and lon. 82° 30′ E.

DIABASE, a fine-grained, compact, crystalline-granular rock, tough and heavy.

DIABASE APHANITE, a very fine-grained or compact variety of quartz-diabase, in which the constituents are not to be recognized without the aid of the lens or the microscope.

DIABETES, a constitutional disease produced by malassimilation in the stomach, liver, kidneys, or in the blood, specially marked by a very excessive discharge of urine, which is always saccharine, excessive thirst, and great bodily emaciation. Dr. Thomas Willis, in the time of Charles II., first observed the constant presence of sugar in the urine. The quantity of urine passed may vary from 10 to 30 or more pints in the day, with intense thirst, the patient often drinking many quarts, or even gallons, daily. The density of the urine is usually increased, and from 400 to 900 grains of sugar

will be passed in each pint of urine. Though life may be prolonged, yet the disease is very intractable.

DIABLERETS (dyä-blē-rā'), a remarkable mountain of the Bernese Alps, Switzerland, on the frontiers of Bern and Valais, with a height of 10,651 feet above the sea. The Diablerets, with their four main peaks, are composed of limestone strata, the lower beds of which are so soft and shaly that they are easily disintegrated, and masses from above tumble over into the valley, occasioning the most terrible catastrophes, as in 1714 and 1749.

DIABOLO, a game played by spinning a top and catching it by means of a cord fastened on two sticks. The game originated in China, became popular in France in the beginning of the 18th century, and later spread into England. It was revived in 1907, and for a time the game was again the rage all through the Continent.

DIACHYLUM, or **DIACHYLON**, formerly a plaster made of the juices of several plants; now a plaster made by boiling hydrated oxide of lead with olive oil. It is used for curing ulcers.

DIAGNOSIS, in medicine (1) The sign or symptom by which a disease is known or distinguished from others; (2) (Pl.) That branch of medical science which deals with the study of the symptoms by which diseases are diagnosed or discriminated; symptomatology. Diagnostics are of two kinds: (1) The special or pathognomonic, which are peculiar to a certain disease, and serve to distinguish it from all other diseases; and (2) the adjunct, or such as are common to many diseases.

DIAL, an instrument for showing the time of day by the sun's shadow. It is evident that the dial having a gnomon which makes with the horizontal plane an angle equal to the latitude of the place is the invention of the Asiatics. Dials are of-various construction, according to the presentation of the plane of the dial.

A dial in telegraphy is an insulated, stationary wheel having alternating conducting and non-conducting portions, against which the point of a spring key is in frictional contact.

DIAL, NATHANIEL BARKSDALE, a United States Senator from South Carolina, born in Laurens co., S. C., in 1862. He was educated at Richmond College, Vanderbilt University, and the law department of the University of Virginia. He began the practice of law in 1883, and also engaged in business, becoming an officer and director in many important industrial and financial institutions. He was defeated as a candidate for the Senate in 1912, but was elected November, 1918, for the term ending 1925.

DIALECT, discourse; conversation; speech; language; argument; phraseology; manner of speaking or expression. In the philosophical sense of the word, a language which resembles another in its general features, but differs from it in detail. The two most widely spread families of language in the world are the Indian-Gothic, and the Semitic. In the former are included the Sanskrit, Zend, Armenian, Greek, Latin, Lithuanian, Slavonic, Teutonic, and Celtic dialects. In all these, the resemblance, though often far distant, is able to be traced. The Semitic embraces the Hebrew, Syriac, Arabic, and other dialects not so well known.

DIALECTICS, the old name for logic, or the art of reasoning and disputing justly. There were several systems of dialectics among the ancients. The dialectics of Plato are a kind of analyses to direct the human mind by dividing, defining, and bringing things to the first truth; which having reached, it applies itself to explain sensible things, but with a view to return to the first truth, where alone it can rest. The dialectics of Aristotle comprise the doctrine of simple words, delivered in his book of "Predicaments"; the doctrine of propositions, contained in his book "De Interpretatione"; and that of the several kinds of syllogism, in his books of "Analytics," "Topics," and "Elenchuses." In modern times various systems of dialectics have been propounded in different countries.

DIALLAGE, a silico-magnesian mineral of a lamellar or foliated structure. Its sub-species are green *diallage*, *hypersthene*, and *bronzite*. The metalloidal sub-species is called *schillerstein*, or *schiller spar*. It forms diallage rock, and enters into serpentine.

DIALLING, the art of making sundials; also the art and practice of mine-surveying, in which the theodolite, magnetic needle, etc., are employed.

DIALOGUE, a conversation or discourse between two or more persons. The word is used more particularly for a formal conversation in theatrical performances, and for a written conversation or composition, in which two or more persons carry on a discourse. This form was much in favor among the an-

cient philosophers as a medium for expressing their thoughts on subjects. The "Dialogues of Plato" are the finest example.

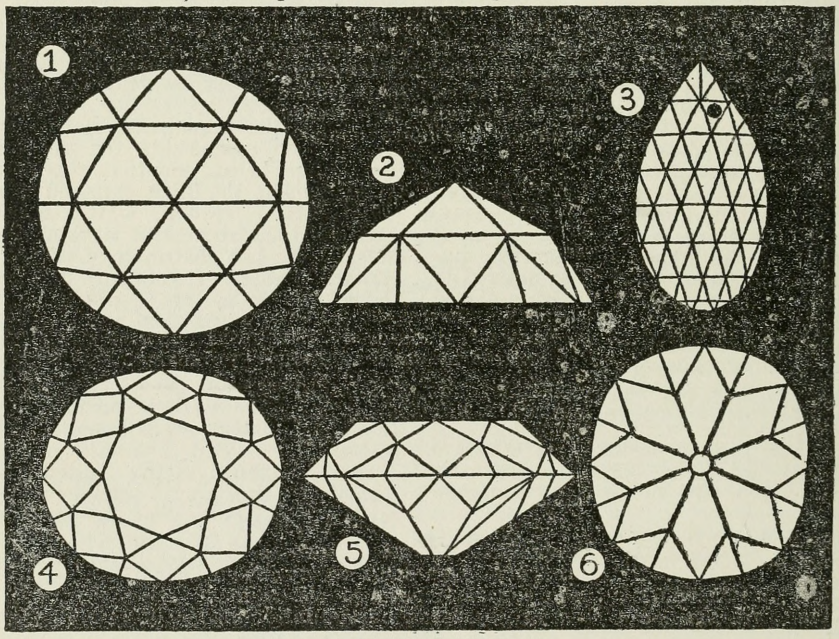
DIALYSIS, a phenomenon observed by Thomas Graham in the middle of last century, consisting in the passage through an animal membrane or parchment of solutions of crystalloids, such as salt or sugar. He carried out his experiments by placing the dialyzer (i. e., a vessel having a bottom made of parchment) in a larger vessel filled with water. He then found that when a crystalloidal solution was poured into the dialyzer, the substance in solution would pass through the diaphragm into the water in the outer vessel. Colloidal solutions, however, would not pass through such diaphragms and so Graham was able to separate colloidal from crystalloidal substances by this means.

DIAMAGNETISM, the moving of bodies such as iron, when placed in a field of magnetic force, from places of weaker to places of stronger force. The opposite is true of bismuth and other substances. Such substances are said to be diamagnetic.

DIAMANTINA (dē-a-mān-tē'nä), a town in the Brazilian province of Minas Geraes. It is the center of a rich diamond district; has manufactures of cotton and goldware, and is the seat of a Roman Catholic bishop. Pop. 13,000.

DIAMETER, in geometry, a line drawn passing through the center of a circle or other curvilinear figure, and terminating each way in the circumference. That point which bisects all lines drawn through a figure from side to side is called a center, and every line drawn through a center and terminating in the circumference or opposite boundaries is a diameter. Every circle has an infinite number of diameters. A diameter which is perpendicular to the chords which it bisects is called an axis. A circle has an infinite number of axis, every diameter being an axis. The parabola has one axis and each of the other conic sections two axes.

DIAMOND, a natural form of carbon, highly valued as a precious stone when transparent and of the crystalline form.



DIAMOND CUTTING

1. Top of rose cutting
2. Side of rose cutting
3. Briolette cutting
4. Brilliant cutting—top
5. Brilliant cutting—side
6. Brilliant cutting—back view

A diamond crystallizes in the cubic or monometric system, its common form being the regular octahedron or a modification of it. The bases are often curved and the general form of the crystal is more or less rounded. The surface of the diamond frequently exhibits striæ and triangular impressions, while the in-

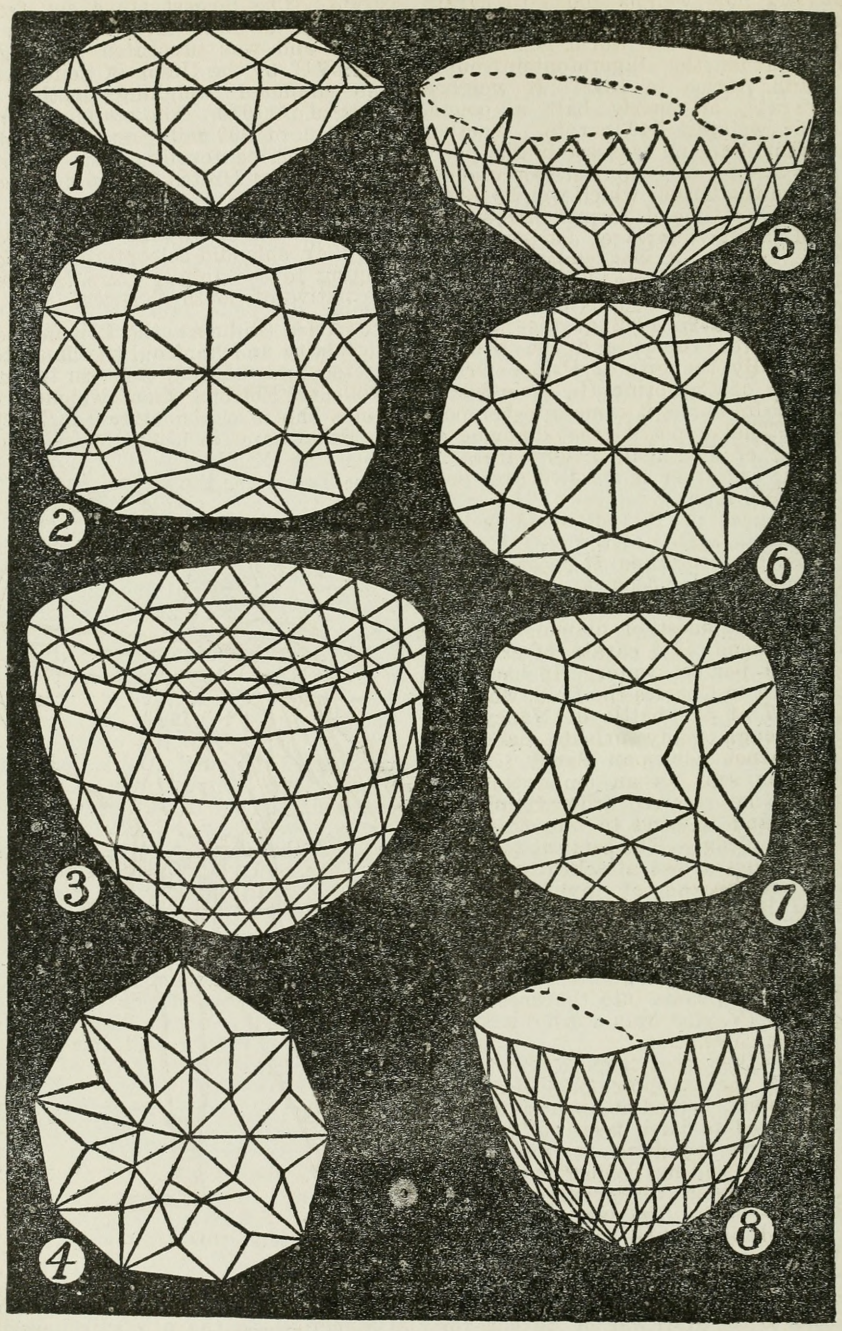
terior may contain microscopic cavities and various inclusions, often black carbon. It is the hardest substance known; but in spite of this hardness it is very brittle and cleavable; specific gravity, 3.52. It is generally colorless, but sometimes tinged pink, red, orange, yellow, green, blue, brown, or black. Blue, red, and green are exceedingly rare colors. Light yellow, straw, and brown are the most common colors; rich yellow and browns are also highly prized. Some bluish-white Brazilian diamonds are phosphorescent in the dark after exposure to the sunlight. Originally diamonds were preserved in their natural form, but in 1456 Louis de Berguin of Bruges discovered the art of polishing them on rotating disks with diamond dust. These circular disks, about 10 meters in diameter, are at the present time of soft steel covered with diamond dust and oil, and made to revolve at 3,000 revolutions a minute. This gives the diamonds the artistic smooth surfaces and sharply defined edges. The process is slow and tedious, and requires great skill to produce fine results. Until a few years ago Amsterdam was the great diamond-cutting center of the world, but the finest cutting is now done in the United States, and in a great measure by machinery. As to the cutting process: Diamonds are, first, cleaved; that is, along the line of cleavage of the stone a tiny cut is made by rubbing the stone with another diamond at the point where it is desired to cleave it, then a dull knife-edge is placed in the cut, and a sharp blow will separate the stone on a cleavage plane. Secondly, diamonds are cut by rubbing two diamonds together, the stones being cemented with shellac to two pieces of wood or handles which are held in the hands, and rubbed together till they are of the desired form. This also has been superseded partly by an American machine.

Diamonds of from 1 to 22 carats each have been found in 24 localities in the United States, mapped by Kunz for the United States Geological Survey. The combustibility of diamonds was proved in 1694 by Averani and Targioni with the aid of burning glasses. That diamonds turned to carbonic acid when burned was proved by Lavoisier in 1772. In 1867, in the S. of Africa, John O'Reilly, a trader and hunter, reached the junction of two rivers, and stopped for the night at the house of a farmer named Van Niekerk. Children were playing with some pebbles they had found in the river. O'Reilly took one of these pebbles to Dr. Atherstone, at Cape Town, who said that it was a diamond of 22½ carats. It was sold for $3,000. Niekerk remembered that he had seen an immense stone in the hands of a Kaffir witch-doctor, who used it in his incantations. He found the man, gave him 500 sheep, horses, and nearly all he possessed for the stone, and sold it for $56,000. This was the famous "Star" of South Africa. It weighed 84½ carats in the rough, and was found to be a gem quite the rival of an Indian stone in purity and brilliancy. After it had been cut it was bought by the Earl of Dudley, and is now known as the Dudley diamond. By 1869, parties in ox-wagons had worked their way over the plains to the Vaal river. Soon a tented city of 12,000 or more foreigners grew at Pniel and Klipdrift, on the opposite banks of the stream, where diamonds were found plentifully. The mines at Kimberley, 600 miles from Cape Town, are the richest in the world. The output of a single mine, the "Kimberley," is $4,000,000 annually, and within 10 years this district has yielded about $58,000,000 in dividends. Ninety-five per cent. of all the diamonds produced in the past 20 years came from South Africa.

Most of the miners are natives, who are kept in compounds for periods of from three to six months; this system has broken up the illicit diamond buyers' ("I. D. B.") system, which seriously threatened the successful working of the mines. The life chairman of this syndicate was the Rt. Hon. CECIL J. RHODES (*q. v.*), who by his genius and will created the corporation apparently out of chaos. The buying and selling of the gems is controlled by the government.

The total value of all the diamonds known to exist in the world to-day is at least $1,000,000,000. It may safely be said that one-third of all the diamonds known are owned in the United States.

Most of the great diamonds distinguished for beauty and size have very interesting histories. One of the most famous is the Koh-i-Nûr, or Koohinoor, "Mountain of Light." The legend is that it was carried 5,000 years ago by the hero Karna, whose deeds are celebrated in the "Mahabharata." It made its first appearance in history in the 14th century, when Ala-ed-din brought it to Delhi. At that time it was supposed to weigh 793 carats. When in 1673 the Grand Mogul sold it to Tavernier, it weighed only 279 carats, having been injured by the lack of skill of a Venetian lapidary. It was brought in 1739 at the sack of Delhi to Afghanistan. Thence it came into the possession of the East India Company, which presented it in 1850 to the English Crown. It was re-cut in



FAMOUS DIAMONDS

1. Southern Star
2. Southern Star
3. Great Mogul
4. Florentine
5. Koh-i-Nûr
6. Koh-i-Nûr (new cutting)
7. Regent or Pitt
8. Orloff

1852 and now weighs 100 1-16 carats. What was at the time said to be the largest stone in the world was sent to London from the Jagersfontein mines in South Africa in 1893. It weighed 971 carats, or nearly half a pound. Another weighed 640 carats. Another important diamond was set in the poi t of the scepter of the Russian empire, known as the Orloff, which weighs 194¾ carats. One time it formed the eye of an idol in the temple of Seringham in Mysore, whence it was stolen. It was in the throne of Nadir Shah, and after his murder it was bought by an Armenian merchant in 1772 at the price of 450,000 silver rubles and the title of nobility. By the gift of Prince Orloff, a favorite of Catherine II., from whom it derived its name, it came into her possession. The supposed great diamond of the King of Portugal, 1,770 carats, is mythical; or rather is a rolled oval pebble of white topaz.

The Regent or Pitt diamond weighs 136.75 carats, and is of the purest water and most perfect shape. It decorated the sword hilt of Napoleon I., and is now in the Galerie d'Apollon in the Louvre.

One of the finest of diamonds is the Sancy diamond, 53½ carats, of exquisite shape and perfect water. It has been traced back to Charles the Bold, who lost it in 1477 at the battle of Nancy. It came through many private hands to the Huguenot nobleman Sancy. When Sancy was sent as an ambassador to Solothurn, he received from Henri III. the command to send to him that diamond as a pledge. The servant to whom it was intrusted was attacked and murdered, but instead of giving up the diamond he swallowed it. Sancy had the body opened and found the precious diamond in his stomach. James II. procured it when he came to France in 1688. Later it came into the possession of Louis XIV. and was worn by Louis XV. at his coronation.

One of the most superb diamonds known is the sapphire-blue brilliant Hope diamond, valued at about $100,000. It is believed to have been cut from a blue diamond weighing in the rough 112½ carats, sold by Tavernier to Louis XIV., and which disappeared in the troubles of 1792. The largest diamond ever found in Brazil weighed 254½ carats, and was discovered in 1853 by a negress in the river Bogageno; it is known as the "Star of the South." It was sold to the Gaekwar of Baroda for $450,000.

The largest and finest diamond in the world to-day was cut from the Cullinan crystal found in the Transvaal in 1905, which weighed in the rough 3,106 metric carats. The largest stone cut from it "The Star of South Africa" weighs 530.2 carats and was presented to King Edward VII. by the Union of South Africa. The diamond weighing method was changed in 1910. The standard "metric carat" is of 200 milligrams divided into hundredths, conforming with the metric system. The United States adopted the new carat July, 1913.

DIAMOND BEETLE (*Entimus imperialis*), splendid coleopterous insect belonging to the family *Curculionidæ*. It it a native of South America.

DIANA (dī-an'a), the Roman goddess of chastity and hunting, the daughter of Jupiter and Latona, and the sister of Apollo or Phœbus, from which circumstance she is occasionally called Phebe, her usual name in heaven, as Diana was



DIANA

on earth. This goddess was worshiped under many forms, which were almost as numerous as the attributes ascribed to her. She was also called Triceps and Tergimina, from her three special spheres of rule; worshiped as Luna in heaven, Diana on earth, and Hècatè beneath the earth, or the Infernal Shades.

As Triceps she was painted with three heads, one of a horse, another of a dog, and the third of a virgin. As Diana she was esteemed the patron goddess of hunting and female chastity, and under a title she sometimes shared with Juno, that of Lucina, her aid was considered propitiatory to women in labor. Diana had a temperament quite as fervid as that of the other members of her august synod, as her amours with Pan, the Carian Shepherd, Endymion, and Orion, fully substantiate. She is represented with a quiver, sometimes attended with dogs, and sometimes drawn in a chariot by two white stags. She is supposed to be the same as the "Isis" of the Egyptians, whose worship was introduced into Greece under the name of Artemis, with that of "Osiris" under the name of Apollo. The most famous of her temples was that of Ephesus.

DIANA MONKEY (*Cercopithecus Diana*), the *Simia Diana* of Linnæus, or Palatine-monkey of Pennant, an African species of monkey, so named from the crescent-shaped band, resembling that which poets and mythologists assign to the goddess Diana.

DIANA OF POITIERS (dē-ä-nä of pwä-tyā), a favorite of Henry II. of France; born in 1499, the eldest daughter of Jean de Poitiers. Married at 13, she became a widow at 32, and ere long attached the affections of the 19 years younger dauphin strongly to herself. On his accession as Henry II. (1547) Diana enjoyed great influence and did much to reform the court. She was made Duchess of Valentinois in 1548, retired from court to her castle Château d'Anet on the king's death in 1559, and died in 1566.

DIANTHUS, a genus of *Caryophyllaceæ*, sub-order *Sileneæ*.

DIAPER, a kind of textile fabric much used for towels and napkins, and formed either of linen or cotton, or a mixture of the two, on the surface of which a flowered or figured pattern is produced by a peculiar mode of twilling.

DIAPHORETICS, agents used in medical practice for producing a greater degree of perspiration than is natural, but less than in sweating. The Turkish bath and a large part of hydropathic treatment, diluent drinks, etc., are employed for this purpose.

DIAPHRAGM, an inspiratory muscle, and the sole agent in tranquil respiration. It is the muscular septum between the thorax and abdomen, and is composed of two portions, a greater muscle arising from the ensiform cartilage, and a lesser arising from the bodies of the lumbar vertebræ by two tendons. There are three openings in the diaphragm, one for the passage of the inferior vena cava, one for the passage of the œsophagus and pneumo-gastric nerves and the aortic, through which passes the aorta, the right vena azygos, and thoracic duct. It assists the abdominal muscles, which are expiratory, powerfully in expulsion, each act of that kind being accompanied or preceded by a deep inspiration.

In optics, an annular disk in a camera or telescope or other optical instrument, to exclude some of the marginal rays of a beam of light.

DIARBEKIR (dē-ar-be-kēr'), a town of Asiatic Turkey, capital of a province of the same name; situated on the right bank of the Tigris; 390 miles N. W. of Bagdad. The town is surrounded by high strong walls, and commanded by a citadel built on a high basalt rock, against which the flat-roofed houses rise above each other in terraces. The population has dwindled to 40,000, mostly Kurds and Armenians. The city is the residence of a pasha, and the seat of a Greek bishop, as also usually of the Jacobite patriarch of Antioch.

DIARRHŒA, a common disease, which consists in an increased discharge from the alimentary canal, the evacuations being but little affected, except in their assuming a more liquid consistence. This is generally preceded or accompanied by flatulence and a griping pain in the bowels, and frequently by nausea and vomiting. Most cases of diarrhœa are caused by the eating of indigestible food, especially unripe or overripe fruit, by overloading the stomach, by cold attacking the bowels or even the feet, by sudden arrest of perspiration, by unwholesome drinking water, and also by impressions on the nervous system. It is often also the symptom of some other disease. It is noticed that where drainage is imperfect and drinking water impure, diarrhœal diseases are specially apt to occur (see CHOLERA); the classes of the population most apt to be affected being those who occupy low levels or who are otherwise exposed to the influence of this aqueous or gaseous poison. Infants are especially apt to suffer from diarrhœa, and a large number of the infantile deaths is caused either directly or indirectly by this diease.

Besides these epidemic diarrhœas, isolated cases of simpler and more obvious origin are very frequent. In some persons diarrhœa is the usual result of catching colds, *i. e.*, they suffer from catarrh of the digestive, instead of, as is most usual, the respiratory organs; but far more fre-

quently diarrhœa results from unwholesome or indigestible food or drink, or from excessive indulgence even in what would otherwise not be hurtful. In all such cases the diarrhœa is to be regarded as beneficial; in fact, it is the natural effort of the intestines to rid themselves of their objectionable contents, and till this is accomplished should be encouraged rather than arrested.

Treatment.—In the treatment of diarrhœa all irritating contents of the intestinal canal should first be removed by a gentle laxative, such as castor oil. This simple remedy is safe and efficient, and, when well mixed with an equal quantity of glycerine and a few drops of oil of checkerberry, can be taken very easily even by children. One teaspoonful of such a mixture is often quite sufficient in itself to effect a cure. Castor oil and aromatic syrup of rhubarb in equal parts can be given to infants in teaspoonful doses at the outset of an attack of diarrhœa with advantage. A teaspoonful or two of Epsom salts taken in plain soda is also very useful in adults for this purpose. In all attacks of diarrhœa quiet and rest in a horizontal position is very desirable, with warmth to the feet and also to the abdomen. The simplest possible diet is desirable. Warm milk sterilized or boiled and perhaps thickened with flour, with stale bread toasted, is usually the best diet till the diarrhœa is entirely well. Other gruels made with milk, like arrowroot or barley, may be safely used.

DIARY, a daily record of events or observations made by an individual.

Diaries have often furnished the historian with invaluable material, supplying the absence of public records, and furnishing minute and intimate details of manners and of motives that do far more to help us to understand the past than more formal records. Such documents as Robert Baillie's "Journals," the "Diaries" of Pepys and Evelyn, and the "Journals" of Greville are among the most valuable sources of real history.

DIAS. See DIAZ.

DIASTASE, a substance existing in barley, oats, and potatoes, but only after germination. When in solution it possesses the property of causing fecula or starch to break up at the temperature of 150° F., transforming it first into dextrine and then into sugar. It is obtained by digesting in a mixture of three parts of water and one of alcohol, at a temperature of 113° F., a certain quantity of germinated barley ground and dried in the open air, and then putting the whole under pressure and filtering it. Diastase is solid, white, and soluble in water and diluted alcohol, but insoluble in strong alcohol.

DIATHESIS, in medicine, a certain general habit or constitution of body as predisposing to certain diseases.

DIATOMS, an order of microscopic plants usually referred to the class *Algæ*. There are more than 4,000 distinct species scattered over all parts of the world. The walls of the cells are rendered hard by silica and they are reproduced by fission, the splitting taking place parallel to the longer axis. When the protoplasm escapes the cell walls retain their shapes and delicate markings. Enormous quantities of them are found as fossils in the beds of the Tertiary formation. Often the protoplasm of two diatoms will escape and unite to form a zygospore, which after a time will divide into two, each forming a new cell larger than before. Some diatoms are free and move rapidly through the water; others secrete a mucilaginous substance whereby they attach themselves to various objects. In some cases the diatoms, after splitting, remain attached to one another, forming bands or ribbons. They are classified, according to the structure of the cell walls, three main families being recognized, according as they have on the principal face of the wall a distinct ridge (*Raphidieæ*), an indistinct or false ridge (*Pseudoraphidieæ*), or no ridge at all (*Araphidieæ* or *Cryptoraphidieæ*).

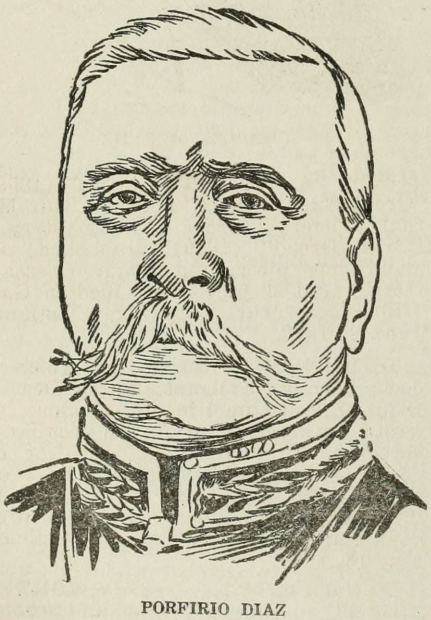
DIATONIC, a term used in the science of music, orignally from the Greek, meaning "by-tones," or "from tone to tone." The diatonic species of the ancient Greeks—as distinguished from their chromatic and enharmonic species—formed the foundation of their whole system of music, and was arranged in tetra-chords (embryo scales) composed of one semi-tone and two whole tones. In modern music, the term is applied to (1) the natural or normal scale, major or minor, which proceeds mainly by whole tones; (2) the different species of intervals (usually reckoned as 14 in number) occurring between the various notes of that scale; and (3) music written wholly or for the most part in that scale.

DIAZ, AMANDO, an Italian general. He was born in 1861, and was educated at the Military College, Turin. He served in the Libyan War and won distinction in the World War. Following the great Italian retreat from the Isonzo river in October and November, 1917, General Diaz was appointed to succeed as commander-in-chief General Cadorna who, after being removed, was made one of the members of the general staff created by the Supreme War

Council. Diaz commanded the operations that stopped the Austro-Germans at the Piave, after they had taken 300,000 prisoners and occupied 4,000 square miles of Italian territory. General Diaz continued as commander-in-chief to the end of the war.

DIAZ, or DIAS, BARTOLOMEU, a Portuguese navigator of noble birth who flourished during the latter half of the 15th century. In August, 1486, the king gave him the command of two vessels with a view to following up the discoveries already made by Portuguese on the W. coast of Africa. Diaz soon reached the limit which had been attained in South Atlantic navigation, and first touched land in 26° S. lat. Driven by a violent storm, he sailed round the S. extremity of Africa without immediately realizing the fact, and discovered Algoa Bay. The discontent of his crew compelled him to return; and arriving in Lisbon, December, 1487, he was at first greeted with enthusiasm, but soon saw Vasco da Gama preferred before him, and was compelled to act under the latter in the expedition of 1497. Three years after, he joined the expedition of Cabral, the discoverer of Brazil, but was lost in a storm May 29, 1500.

DIAZ, PORFIRIO (dē'äth), a Mexican statesman; born in Oaxaca, Sept. 15,



PORFIRIO DIAZ

1830; received a classical education at the Oaxaca Institute, and had begun studying law when the war with the United States broke out; served through that struggle in the National Guard, and on the conclusion of peace made a study of military science. On Santa Ana's accession to the dictatorship, he left the army and practiced law, but returned and bore a conspicuous part in the revolution of 1854; took the field to oppose the French troops and was taken prisoner, but made his escape; harassed Maximilian's troops till forced to surrender a second time at Oaxaca in 1865; besieged and captured Puebla in 1867, and immediately marched on Mexico City, which surrendered to him June 21. On the re-establishment of the republic he was an unsuccessful candidate for president. In 1872 and 1876 he led revolutions against the government, and occupied the capital in the latter year. In 1877 he was elected president. According to the "plan of Tuxtepec," which he had proclaimed, he was ineligible to succeed himself. His secretary, General Gonzales, was elected president, and General Diaz was appointed Chief-Justice of the Supreme Court, and elected governor of Oaxaca. In 1884 he was re-elected president; in 1886 his partisans secured the abolition of the law prohibiting a second consecutive presidential term, and he was thereafter continuously re-elected for seven consecutive terms. He abdicated May 22, 1911, and died in July 1915.

DIAZ DEL CASTILLO, BERNAL (dē'äth del käs-tē yō), a Spanish chronicler of the conquest of Mexico; born about 1498; died in Mexico about 1593. His "True History of the Discovery and Conquest of New Spain" was published at Madrid in 1632.

DIBRANCHIATA, an order of cephalopods characterized by the possession of two gills only, and by the fact that the shell, if external, as is rarely the case, is never chambered. It includes the cuttlefishes, squids, and paper nautilus. The order contains two sections, *octopoda* and *decapoda*.

DICE (plural of die), small cubes of ivory marked on their sides with black dots, from one to six. The points on the opposite sides of the dice should always sum seven—*i. e.*, ace should be opposite to six (pronounced size); deuce to cinque (pronounced sanke); and trey to quatre (pronounced kater). The invention of dice is attributed to Palamedes (circa 1244 B. C.).

DICENTRA, a genus of plants, order *Fumariaceæ*, tribe *Fumarieæ*. *Cucullaria* has been employed as a medicine to expel intestinal worms, and as an emmenagogue. It is a tree growing in Brazil and Guiana.

DICHLAMYDEOUS, a term in botany applied by De Candolle to distinguish those dicotyledonous flowers possessed of both calyx and corolla from his *Monochlamydeæ*, in which not more than one floral envelope is present.

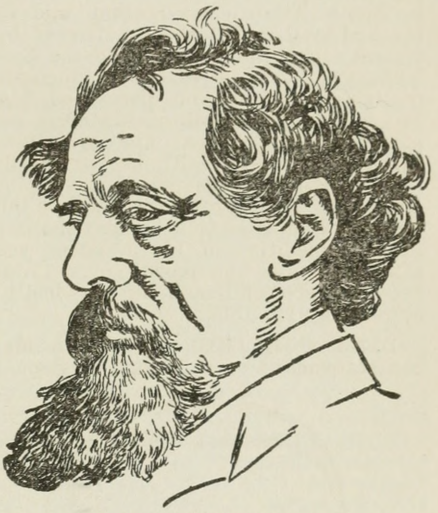
DICHOGAMY, a provision in hermaphrodite flowers to prevent self-fertilization, the stamens and pistils within the same flower not being matured at the same time.

DICHOTOMY, in logic, a distribution or separation of ideas by pairs; the division of a class into two sub-classes opposed to each other by contradiction. In botany, a term applied to that kind of branching by a constant furcation or division into two parts, as where the stem of a plant branches into two branchlets, each of which in its turn divides into others, and so on. Example, the mistletoe. The veins of various ferns thus branch dichotomously. In astronomy, that phase of the moon where it appears bisected or is only half illuminated, as at the quadratures.

DICHROISM, the property by which a crystallized body assumes two or more colors, according to the direction by which light is transmitted through it. Examples, iolite, mica, muriate of palladium, etc. Dichroism depends upon the absorption of some of the colored rays of the polarized light in its passage through the crystal, this absorption varying with the different relative positions of the planes of primitive polarization of these rays to the axis of double refraction of the crystals, so that the two pencils formed by double refraction are differently colored.

DICHROITE. See CORDIERITE.

DICKENS, CHARLES, an English novelist; born in Landport, Portsea, Feb. 7, 1812. Early in life the law was selected as his future profession, but the drudgery of an attorney's office worried him, and removing to London he became a reporter of Parliamentary debates for the "Morning Chronicle" newspaper. To this journal he presently contributed a series of papers sketching off the social characteristics of English middle and low class life. In 1836, under the title of "Tales and Sketches by Boz" the papers were published in two volumes. The production of the celebrated "Pickwick Papers," in the year following (1837), conclusively stamped him as an author of a peculiarly original cast of genius. A long and brilliant series of successes followed. His works include: "Sketches by Boz" (1835-1836); "Pickwick Papers" (1837); "Oliver Twist" (1838-1839); "Nicholas Nickleby" (1839); "Master Humphrey's Clock" (1840-1841), a weekly issue in periodical form, comprising among others the installments of "Old Curiosity Shop" and "Barnaby Rudge"; "American Notes" (1842); "A Christmas Carol" (1843); "Martin Chuzzlewit" (1844); "The Chimes" (1844); "The Cricket on the Hearth" (1845); "Pictures from Italy" (1846); "The Battle of Life" (1846); "Dombey and Son" (1848); "The Haunted Man" (1848); "David Copperfield" (1850); "Bleak House" (1853); "A Child's History of England" (1854); "Hard Times" (1854); "Little Dorrit"



CHARLES DICKENS

(1857); "A Tale of Two Cities" (1859); "Great Expectations" (1861); "Our Mutual Friend" (1865); "The Mystery of Edwin Drood" (1870), unfinished; and many short pieces and humorous essays, stories, and sketches. He died in Gad's Hill Place, near Rochester (England), June 9, 1870.

DICKINSON, EMILY, an American poet; born in Amherst, Mass., Dec. 10, 1830. Living the life of a recluse, she wrote much verse in forms peculiar to herself. In 1892 a collection of her poems was issued which received warm praise from competent critics. In all, three volumes of her verse and prose have appeared. She died in Amherst, May 15, 1886.

DICKINSON, GOLDSWORTHY LOWES, an English writer and scholar. He was educated at the Charterhouse School and at King's College, Cambridge, where he became a lecturer. He studied also at the London School of Economics

and Political Science. His published writings include "The Greek View of Life" (1890); "The Tragedy of the Puritan Revolution" (1891); "The Development of Parliament During the Nineteenth Century" (1895); "Letters From a Chinese Official" (1903); "Religion and Immortality" (1911); "The European Anarchy" (1916); "The Choice Before Us" (1917).

DICKINSON, JACOB MC GAVOCK, an American public official, born in Columbus, Miss., in 1851. He graduated from the University of Nashville in 1871 and studied law at the Columbia University and at foreign universities. He was admitted to the bar in 1874 and from that date until 1899 practiced law in Nashville, Tenn. From 1899 to 1909 he was engaged in practice in Chicago. He was appointed assistant attorney general of the United States in 1895, serving until 1897. In 1903 he was counsel for the United States before the Alaskan Boundary Tribunal. He was on the legal staff of the Illinois Central Railroad Company from 1889 to 1909. He was appointed Secretary of War by President Taft in 1909, serving until 1911, when he resigned. In 1907 and 1908 he was president of the American Bar Association. During the World War he was honorary president of the Chicago Branch of the National Security League.

DICKINSON COLLEGE, a coeducational institution in Carlisle, Pa.; founded in 1783, under the auspices of the Methodist Episcopal Church; reported at the end of 1919: Professors and instructors, 15; students, 375.

DICKMAN, JOSEPH THEODORE, an American soldier, born in Dayton, O., in 1857. He graduated from the United States Military Academy in 1881 and was commissioned 2d lieutenant in the 3d Cavalry. He rose through the various grades, becoming lieutenant-colonel in 1899. He served during the Spanish-American War and was honorably mustered out of the volunteer service in 1901. In 1906 he was appointed major of the 13th United States Cavalry, and in 1909 became inspector-general. He was appointed lieutenant-colonel in the cavalry in 1912, and in 1914 was promoted to be colonel. He became brigadier-general in 1917, and in the same year was appointed major-general in the National Army. In July, 1918, he was given command of the Third Division of the American Expeditionary Force, and he commanded the American Army of Occupation in Germany following the armistice.

DICKSON, HARRIS, an American lawyer and writer, born in Yazoo City, Miss., in 1868. He was educated in the common schools and studied law at Columbia University. From 1896 he engaged in practice in Vicksburg, Miss., and from 1905 to 1907 was judge of the Municipal Court of that city. He was the author of "The Black Wolf's Breed" (1899); "The Ravanels" (1905); "Old Reliable" (1912); "The House of Luck" (1917); "Unpopular History of the United States" (1917). He contributed numerous articles and fiction to magazines. In 1917 he acted as war correspondent in France for Collier's Weekly.

DICKSON CITY, a borough of Pennsylvania, in Lackawanna co. It is on the Delaware and Hudson Company, and the New York, Ontario and Western railroads. It is the center of an important coal mining region and has foundries, silk mills, and machine shops. Pop. (1910) 9,331; (1920) 11,049.

DICOTYLEDON, in the singular, a plant having two cotyledons or seed-leaves, that is, primordial leaves, contained in the embryo. The majority of flowering plants have this structure. When therefore seed is sown, in most cases the future plant first appears above the ground as a tiny two-leaved existence, and in certain cases the next pair of leaves which appear, and all the future ones, are of a different structure from the first. The primordial pair of leaves are the two cotyledons. Their use in the economy of nature is to shelter the ordinary leaves situated inside. In the plural the highest class of the vegetable kingdom, containing orders of plants with the structure of seed just described.

DICRANACEÆ, a family of apocarpous operculate mosses, branching by innovations or with the tops of the fertile branches several times divided. The leaves are lanceolate or subulate; cells prosenchymatous, rarely papillose; capsule oval or cylindrical, arched or straight.

DICRANUM, a genus of mosses, the typical one of the family *Dicranaceæ*.

DICTAMNUS, a genus of plants, belonging to the order *Rutaceæ*, and found in southern Europe, Asia Minor, etc. *D. Fraxinella*, false dittany, abounds in volatile oil to such a degree that the atmosphere around it becomes inflammable in hot, dry, and calm weather.

DICTATOR, a magistrate of ancient Rome, created in times of great emergency, distress, or danger and invested, during the term of his office, with absolute and unlimited power. The name

given to this magistrate was originally Magister Populi, but subsequently he was styled dictator, a name already familiar to the Latin states. The office was probably first created in B. C. 501, and the first dictator was Titus Larcius. The dictator was nominated by one of the consuls in pursuance of a decree of the Senate, whence the name, from the technical phrase, Dicere dictatorem. The nominator performed his duty at dead of night. Originally only one who had held the office of consul could be named dictator, but subsequently the office was thrown open to all, the first plebeian dictator being C. Marcius Rutilus, in B. C. 356. The dictator was named for six months only, but he seldom retained the office after the object for which he had been appointed was fulfilled. The office was abolished by law after the death of Cæsar.

DICTIONARY (from the Latin *dictio*, a saying, expression, word), a book containing the words, or subjects, which it treats, arranged in alphabetical order. It may be either a vocabulary, or a collection of the words in a language, with their definitions, or a special work on one or more branches of science or art prepared on the principle of alphabetical arrangement, such as dictionaries of biography, law, music, medicine, etc. Among the dictionaries of the English language, the earliest seem to have been those of Barett (1573), and of Bullokar (1616). That of Dr. Johnson published in 1755 made an epoch in this department of literature. The first important dictionary of the English language is that by Noah Webster (1828). It has been frequently republished, and in subsequent editions has almost entirely altered its character. The large American dictionary by Dr. Worcester was once a rival of Webster's. Dr. Ogilvie's English dictionary (based on Webster, and first published in 1847-1850) was published in a remodeled and enlarged form (4 vols. 1881-1882, Chas. Annadale, LL.D., editor). Cassell's "Encyclopædic Dictionary" is another extensive and useful work (1879-1888). An English dictionary "on historical principles," edited by J. A. H. Murray, LL. D., with the assistance of many scholars, is published at the Clarendon Press (London). The "Century Dictionary" (New York, 1889-1891) in six volumes, with a supplementary "Cyclopædia of Names," is a comprehensive and useful work. In 1895 appeared the "Standard Dictionary" (New York), which adopts the spelling reform system of the American Philological Association. A revised edition appeared in 1915. The chief etymological dictionary of English words is that by Professor Skeat (1882); the chief French is that of Littré; German, that of Grimm.

DICTOPHONE. An instrument made up of an ordinary telephone circuit to which is attached a granular carbon transmitter of a sensitiveness adequate to take up the words of persons conversing in a room so that they can be heard and recorded over the telephone. The transmitter is usually made small enough to be capable of concealment and the instrument has been in the main employed by detectives for the gathering of evidence relating to persons under suspicion. It is also coming into use for the reproduction of sounds in various parts of a hall and has also been installed in the waiting room of railway stations, the announcer having his voice megaphoned by telephone receivers located in different parts of the building.

DICTYNNA, a nymph of Crete, and one of the attendants of Diana.

DICTYOGEN, a member of the sub-class *Dictyogenæ*.

DICTYOGENÆ, sub-class of monocotyledonous plants with leaves reticulated, often articulated with the stem; branches with the usual structure of endogens, but the rhizomes or underground stems have the woody matter disposed in a compact circle, or in wedges containing central cellular tissue, and often showing medullary processes. It comprises three orders, *Dioscoreaceæ*, or yam tribe; *Similaceæ*, or the sarsaparilla family; and *Trilliaceæ*, or the trillium family.

DICYEMIDÆ, a family of very lowly multicellular organisms, parasitic in habit. They are found in cuttlefishes, while related organisms known as *Orthonectida* occur in a brittle-star and in a Nemertean worm. The largest species of the genus *Dicyema* measures 5-7 millimeters; the smallest is 10 times less.

DICYNODON, a genus of fossil reptiles occurring in a sandstone, supposed to be of Triassic age, in southern Africa and India. The principal remains yet found, the bones of the head, indicate a gigantic type between the lizards and turtles. Order, *Anomodontia*.

DIDACTIC, or DIDACTICAL, a term applied to every species of writing, whether in verse or prose, the object of which is to teach or explain the rules or principles of any art or science. Thus, to this class of literature belong the writings of Aristotle on grammar, poetry and rhetoric; Longinus's "Trea-

tise on the Sublime"; the "Institutiones of Quintilian," etc.; but the term is more exclusively applied to all poetical writings devoted to the communication of instruction on a particular subject, or of a reflective or ethical character, thence called didactic poetry. Among the most celebrated poems of this species may be reckoned in ancient times, that of Lucretius, "De Rerum Natura;" Vergil's "Georgics"; and Horace's "Art of Poetry"; in more recent times, Pope's "Essay on Criticism," and "Essay on Man"; Du Fresnoy's "Art of Painting"; Vida and Boileau's "Art of Poetry."

DIDELPHIA, one of the three primary divisions into which the class *Mammalia* is divided, when the structure of the reproductive organs is taken as a basis for classification; the other two being the *Ornithodelphia* (Monotremata) and the *Monodelphia*. Didelphia comprises the Marsupialia or those non-placental mammals in which the uterine dilations of the oviducts continue distinct throughout life, opening into two separate vaginæ, which in turn open into a urogenital canal, distinct from the rectum, though embraced by the same sphincter muscle. The young of this subclass are born imperfect, or, as it were, prematurely, and are carried in the pouch or second womb till perfect.

DIDEROT, DENIS (dē-drō′), a French philosopher, foremost of the "Encyclopædists"; born in Langres, Oct. 5, 1713. "Philosophic Reflections"—burned by the hangman and therefore widely circulated—and "A Skeptic's Walk" (1747), were part of a warfare against the church. In the compilation of the "Encyclopædia" Diderot bore the main burden. He wrote all the articles on technology and industries, on points of philosophy, and even on physics and chemistry. He wrote admirable reports (1765-1767) of the art expositions at the Paris Academy, and some plays. His novel, "The Nun," and his dramatic dialogue, "Rameau's Nephew," are wonderfully effective pictures of the corrupt society of the time. His little sketches "Little Papers" show kindly humor and wit. He died July 31, 1784.

DIDIER, CHARLES (dēd-yā′), a French poet and novelist (1805-1864); born in Geneva. He wrote some novels designed to awaken patriotic sentiment in Italy, and to make known the struggles of the carbonari and other revolutionists against Austrian and papal dominion. Among these novels were: "Underground Rome" (2 vols. 1833); "The Roman Campagna" (1842); and "Fifty Years in the Wilderness" (1857). His lyric poems, "Melodies" (1827), are unimportant.

DIDIER, EUGENE LEMOINE, an American prose-writer; born in Baltimore, Md., Dec. 22, 1838. Many of his writings have appeared over the signature "Lemoine" and "Timon." He published the "Life of Edgar A. Poe" (1876); "Life and Letters of Madame Bonaparte" (1879), republished in London and translated into French and Italian; a "Primer of Criticism" 1883); etc.

DIDIUS SALVIUS JULIANUS, MARCUS, a Roman emperor, born about A. D. 133. Having filled the offices of questor, ædile, and prætor, he was appointed commander of a legion in Germany, and subsequently governor of Belgica. For his services against the Catti, he was made governor of Dalmatica, and next of lower Germany. Having distinguished himself in Africa and Asia Minor, he returned to Rome, and, on the assassination of Pertinax, made himself emperor by bribing the prætorian guards. He now assumed the name of Marcus Didius Commodus Severus Julianus; but, after a short reign of two months, was killed in his palace by a common soldier, A. D. 193.

DIDO, or ELISSA, the reputed founder of Carthage. She was the daughter of a king of Tyre, and after her father's death her brother Pygmalion murdered her husband Sicharbas, or as Vergil calls him Sichæus, with the view of obtaining his wealth; but Dido, accompanied by many Tyrians of her party, fled with all the treasure over sea, and landing on the coast of Africa founded Carthage about 860 B. C. The story is told by Vergil with many inventions of his own in the "Æneid" (books i and ii).

DIDONCEPHALUS, a monster with a double range of teeth, or a double jaw.

DIDUNCULIDÆ, a family of *Columbacei* (pigeons), which some authorities connect with the extinct dodo.

DIDUNCULUS, the typical genus of the family *Didunculidæ*. *D. strigirostris* inhabits the Navigator Islands.

DIDYMIUM, a metallic triad element, symbol Di‴, atomic weight 144. It occurs along with cerium and lanthanum in the mineral cerite. It is separated from cerium by igniting the oxalate, and treating the resulting oxides with very dilute nitric acid, which does not dissolve the cerium oxide. The filtered solution is mixed with sulphuric acid, concentrated by evaporation, and then a hot solution of potassium sulphate is added, which precipitates the

lanthanum and didymium as double sulphates. Didymium can be separated from lanthanum by precipitating half the oxide with ammonia, and leaving the precipitate in contact with the solution; the lanthanum, being the stronger base, then passes into solution in predominant quantity. By repeating the process, the oxides being again dissolved and precipitated, the didymium oxide is obtained nearly pure. Didymium is a white metal with a tinge of yellow; specific gravity, 6.5. It tarnishes in dry air; it burns with great brilliancy when thrown into a flame. Its oxide, Di_2O_3, is a dirty bluish color; the nitrate is obtained in large violet crystals by dissolving the oxide in nitric acid. The sulphate, $Di_2(SO_4)_3$ $6H_2O$, forms rose-red crystals. The oxalate is a crystalline powder. The spectrum of a solution of a salt of didymium contains characteristic dark bands.

In botany, the word is applied to a genus of gasteromycetous fungi, consisting of minute plants growing upon leaves, bark, rotten wood, etc., distinguished by its double peridium.

DIE, a word with various applications. (1) In punching-machines, a bed-piece which has an opening the size of the punch, and through which the piece is driven. This piece may be a planchet or blank, or it may be merely a plug driven out of the object to form a bolt or rivet hole. In nut-machines the nut-blanks may be made by one die and punched by another. (2) In forging, a device consisting of two parts which co-act to give to the piece swaged between them the desired form. (3) In sheet-metal work, a former and punch or a cameo and intaglio die between which a piece of sheet-metal is pressed into shape by a blow or simple pressure. In coining, both dies are intaglio, so as to make a cameo or raised impression upon each face of the planchet. The upper die has the obverse, the face, which is often the bust of the sovereign or national emblem. The lower die has the reverse, with an effigy, legend, value, escutcheon, as the case may be. Owing to the random way in which ornaments are disposed on coins, any general definition will no longer meet all cases. A die will sometimes deliver 250,000 impressions before it is necessary to remove it from the coining-press; and sometimes a die will crack at the first impression.

DIEGO GARCIA (dyā'gō gär-thē'a), an island of the Indian Ocean, in lat. 7° S., and lon. 72°—73° E., extends in an irregular horseshoe shape, and is 30 miles long, embracing between its extremities three minor islets (the Chagos Islands). It contains a spacious bay, and is very convenient for coaling purposes. The group has about 700 inhabitants, and is a dependency of Mauritius.

DIELMAN, FREDERICK, an American painter; born in Hanover, Germany, Dec. 25, 1847; removed to the United States in childhood, and graduated at Calvert College. He was a topographer and draughtsman in the United States Engineer Department in 1866-1872. He studied art under Diaz at Munich, and established a studio in New York in 1876. He is a member of the National Academy and other art organizations; was the designer of the Mosaic panels, "Law" and "History" in the new Congressional Library at Washington, D. C.; and was president of the National Academy of Design (1889-1902), Professor of Drawing, College of the City of New York (1903-1918) and director of the Art School of Cooper Union.

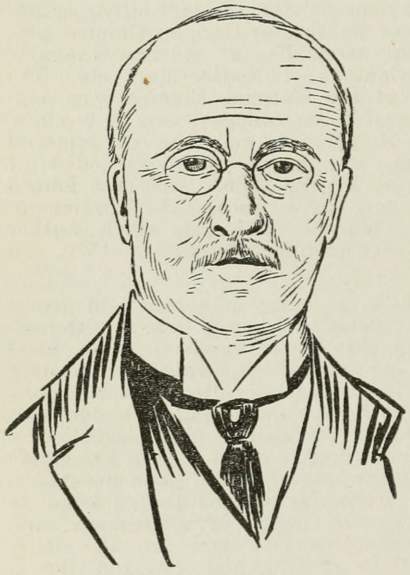
DIELYTRA, a genus of plants belonging to the natural order *Fumariaceæ*, or *Fumitories*. The best known is *D. spectabilis*, a native of northern China and Siberia, now common in European and other gardens. It blossoms in April and May, and its long drooping racemes of purplish-red blossoms present a very graceful appearance. It grows freely in the open air. It is sometimes called pendent heart or virgin's heart, but is more commonly known as bleeding heart.

DIEMEN, ANTON VAN, a Dutch administrator; born in 1593. Having gone to India, he speedily rose to the highest dignities, and was at length, in 1636, made governor-general. He administered the government with much ability, and contributed much to the establishment of Dutch commerce in India. Abel Tasman, whom he sent with a vessel to the South Seas in 1642, gave the name of Van Diemen's Land to the island now called Tasmania. Van Diemen died in 1645.

DIEPPE (dē-ep'), a seaport town of France, department of Seine-Inférieure, on the English Channel, at the embouchure of the Arques, 93 miles N. N. W. of Paris. Almost the only public edifices worth special notice are the two Gothic churches, St. Jacques, begun in the 13th century, and St. Rémi, founded in 1522, and the old castle (1433), now a barrack. To the W. of Dieppe proper is the suburb La Barre; and on the opposite side of the harbor La Pollet, inhabited chiefly by sailors and fishermen. The

port is spacious, admitting vessels of 1,200 tons burden; but it cannot be entered at low water. Dieppe is one of the chief watering places of France, and is much frequented by visitors in summer and autumn. The great bathing establishment forms a luxurious retreat for bathers and invalids, and includes a ball-room and other attractions. The manufactures include works in ivory, the most famed in Europe; works in horn and bone, lace-making, sugar-refining, ship-building, etc. There is a busy fishery, and the foreign trade is still considerable. There is constant steam intercourse between this port and Newhaven. In early times Dieppe was the chief port of France, but its prosperity diminished after the revocation of the Edict of Nantes (1685). Pop. about 25,000.

DIESEL, RUDOLF, a German inventor, born in Paris in 1858. He studied in England and at the Polytechnic School in Munich. After his graduation he lived in Paris for a few



RUDOLF DIESEL

years, acting as manager of a refrigerating company. He finally settled in Munich in 1895. After some years of experiment he successfully solved the problem of the internal combustion engine and patented his DIESEL ENGINE (*q. v.*). In 1912 he delivered a series of lectures in the United States. Called the next year by the British Admiralty to consult with them in reference to his engine, his career was brought to an untimely end by drowning in the English Channel. His monograph on the Diesel Engine has been translated as "Theory and Construction of a Rational Heat Motor".

DIESEL ENGINE, a special type of internal combustion engine. The principle on which it works differs from that of the ordinary gas engine, in which an explosive effect is produced by drawing the combustible charge into the cylinder and igniting instantaneously. In the Diesel engine, air is drawn into the cylinder and compressed, and then oil is injected as a fine spray and burned gradually. The engine is made in two types, the four-stroke and the two-stroke. In the four-stroke engine, air is drawn into the cylinder on the first stroke, and is compressed on the second stroke to a pressure of 450 pounds per square inch. This sudden increase in pressure causes a rise in temperature to about 550 degrees C., and during part of the third stroke, oil is injected, and, owing to the high temperature, ignites. The gases thus produced expand, and during the fourth stroke of the piston the products of combustion are expelled. In the two-stroke engine, the general procedure is the same, but differs in details. Air, instead of being drawn into the engine by the stroke of the piston, is forced in under slight pressure, and is then further compressed to the same pressure as in the case of the four-stroke engine. Fuel is injected, and ignites, the gases expand, and are finally expelled by the incoming charge of air.

Among the advantages claimed for the Diesel engine are: firstly, the fact that it will burn any class of oil, refined or crude; secondly, the facility with which it can be started; thirdly, its low fuel consumption, and finally the small space occupied by it. The makers claim for it a mechanical efficiency of upward of 70 per cent., and provided the fuel has a calorific value of not less than 18,000 B. T. U's per pound they guarantee that the consumption at full load will not exceed 0.4 lbs. per b. h. p. hour in the larger sizes and 0.5 lbs. per b. h. p. hour in the smaller sizes. Moreover, the engine runs quietly and as the flash-point of the oil fuel is high there is no danger of explosion.

These many advantageous features render the engine of value for marine service, and during recent years it has been installed on a number of passenger and war vessels, particularly in ships of the British navy. The first passenger vessel propelled by Diesel engines was the "Selandia" belonging to the

East Asiatic Company, plying between Copenhagen and Bangkok. Its gross tonnage was 4,964, its length 370 feet, and beam 53 feet. It had twin screws, each driven at 140 revolutions per minute by an eight-cylinder, four-cycle Diesel engine. Its speed was 12 knots and its indicated horse power 2,500. A feature of the boat was that it had no funnels, the exhaust gases being carried away up the mizzen mast.

The great advantage of the Diesel engine over the steam turbine for marine service is the tremendous reduction which can be effected in the weight of fuel. It is estimated that this amounts to only one-fourth to one-fifth of that consumed by a vessel equipped with steam turbines. It follows from this that there is an actual saving in the cost of the fuel where the price of oil is not more than four times that of coal, but it must also be remembered that a vessel equipped with Diesel engines has a cruising radius at least four times as great as a steamship having the same bunker capacity. The latter point is of particular value when considered in connection with war vessels. In the case of passenger and cargo boats, the reduced space occupied by the machinery and its smaller weight are equally important. Allowing for the same bunker space, with its consequent increased cruising radius, a vessel equipped with Diesel engines has 15 per cent. more cargo space than a boat fitted with a steam engine, and with the same cruising radius the reduction in bunker space renders still more room available for cargo. Stokers, moreover, are entirely dispensed with, and the number of men required in the engine room is usually about two-thirds of the number needed in the engine room of a steam vessel.

Although the principles underlying the Diesel engine are simple, its design and construction demand the highest engineering skill and its present state of perfection has been reached only after many years of experiment and investigation. It follows that the engine, although economical to run, is costly to install, and as a result, many attempts have been made to produce a modified form of the engine which should be equal to the original as regards fuel economy, but which should be easier, and cheaper to construct. Most of these modifications seek to avoid the high compression and high pressure air blast which are needed in the Diesel engine, and several very successful types have been designed. These engines are commonly known as "semi-Diesels". Since the compression of the charge is comparatively low (varying from 125 to 250 lbs. per square inch), some auxiliary igniting device is necessary. The one most commonly adopted is the so-called "hot bulb." This consists of a bulb-shaped chamber, communicating with the combustion chamber. A portion of the oil fuel is sprayed into this bulb, the rest being delivered into the combustion chamber. The oil in the bulb is heated, at starting, by a lamp, and is thus ignited. The flame produced impinges upon and ignites the oil spray in the main combustion chamber. Once the engine is running, the lamp is no longer needed, as the ignition bulb is kept hot by the combustion of the fuel within it.

DIE-SINKING, the art of making dies for coins, medals, etc. It is a branch of engraving, but involves turning, tempering, and the use of other tools besides the graver.

DIET, a meeting or assembly of delegates or dignitaries convened and held from day to day for legislative, ecclesiastical, political, or administrative purposes; specifically, the legislative assemblies of the former German Empire, provincial assemblies of Austria-Hungary, the Cantons of Switzerland, etc. The Diet of the German Empire was composed of three colleges: one of electors, one of princes, and one of imperial towns, and began with the edict of Charles IV. in 1356. The best known meetings were those at Nuremberg, 1467, Worms, 1521 (at which Luther was excommunicated), Spires, 1529, and Augsburg, 1530.

DIET, a course of eating and drinking, especially when followed with reference to hygienic effect. The ideal diet is that which, without burdening the viscera uselessly, furnishes all necessary nutritive elements, with due consideration for special physiological conditions in any given case. No single substance contains all the elements, in their requisite proportions, needed to replace the waste of nitrogenous and non-nitrogenous matter in the daily functions of life, and a mixed diet is therefore necessary.

The nature of the food most suitable for a healthy man is dependent in part on general conditions, such as climate and season, and in part upon special conditions of individual habit. The inhabitants of the Arctic regions need large quantities of oleaginous food; those of the tropics live chiefly on starchy products. With increased activity and exertion, as in training, an increase in the nitrogenous foods becomes necessary. In a state of health

the quantity rather than the quality of food is the main consideration. Stewed and boiled meats are more difficult to digest than meat cooked by fire alone. The flesh of young animals seems to be more difficult of digestion than that of old; and the flesh of tame than that of wild animals. All sorts of fat meat must be taken in smaller quantities. Hence, also, ham, bacon, and salted meats cannot be eaten in such quantities as the tender flesh of poultry. Fish has the advantage of being easily soluble. All boiled vegetables are in general easy of digestion; raw vegetables and salads are more difficult. Fruit should be taken in the forenoon rather than after a hearty meal.

In all diseases attended with fever the stomach loathes animal food, and there is generally an increase of thirst, to quench which cool water, or tepid, or rendered acid, may be freely indulged. Infusions, too, of barley, sage, balm, etc., may be taken. In chronic diseases attended with hectic fever, milk is the proper diet. The best food for infants is, of course, their mother's milk; but when they begin to cut teeth a little animal food, such as soft-boiled eggs, or chicken minced very fine, may be given.

DIFFERENTIAL CALCULUS, that branch of mathematics which has for its object the explanation of the method of deriving one determinate function from another by the process of differentiation. If in any determinate function of one variable we give to the variable a constant increment, and find the corresponding increment of the function, and then divide the increment of the function by the increment of the variable, we shall find a ratio which will in general be dependent upon the increment of the variable. If now we pass to the limit of this ratio, by making the increment of the variable equal to 0, we shall in general obtain a function of the original variable, which is called the differential coefficient of the function. If this be multiplied by the differential of the variable, the result is called the differential of the function. Any function of a single variable will have one, and only one, differential coefficient, and consequently it will have but one differential of the same order. The differential calculus consists of two parts. The first embraces the science of the differential calculus, and explains the methods of finding the differentials and successive differentials of all determinate functions. The second treats of the application of the differential calculus to the other branches of mathematics, as algebra, analytical geometry, etc. See CALCULUS.

DIFFERENTIAL THERMOMETER, an instrument for determining very minute differences of temperature. Leslie's differential thermometer consists of two glass bulbs containing air connected by a bent tube containing some sulphuric acid, the movement of which (as the air expands and contracts) serves to indicate any slight difference of temperature between the two bulbs.

DIFFRACTION, a term applied to certain phenomena connected with the modification that rays of light undergo in passing close to the edge of an opaque body. Thus when a beam of direct sunlight is admitted into a dark room through a narrow slit, and falls upon a screen placed to receive it, there appears a line of white light bordered by colored fringes; these fringes are produced by diffraction.

DIFFUSION, a word having several applications. (1) The act of diffusing or spreading about of a liquid, fluid, etc.; (2) a spreading or diffusing abroad of a matter; (3) the state of being spread or dispersed widely; (4) the act of spreading, extending or propagating widely, as the diffusion of knowledge; (5) copiousness, exuberance of style, prolixity, verbosity.

Diffusion of gases is the passing of one gas into the space occupied by another. The name given to that phenomenon by which the composition of the atmosphere is kept uniform, or nearly so. Gases diffuse into one another according to a fixed law, that is, inversely as the square root of their densities.

Diffusion of heat is a term applied to those modes by which the equilibrium of heat is effected—viz., conduction, radiation, and convention.

Diffusion of liquids: When two liquids that are capable of mixing are put in contact they gradually diffuse one into the other, notwithstanding the action of gravity.

DIGAMMA, the name given to a letter in the oldest Greek alphabet, which early fell into disuse, being retained longest in the Æolian dialect. It is considered to have had the power of the English w or v, and is frequently represented in Latin by u (v): thus, Gr. *oikos*=Lat. *vicus*, Eng. wick; Gr. *oinos*=Lat. *vinum*, Eng. wine. See ALPHABET.

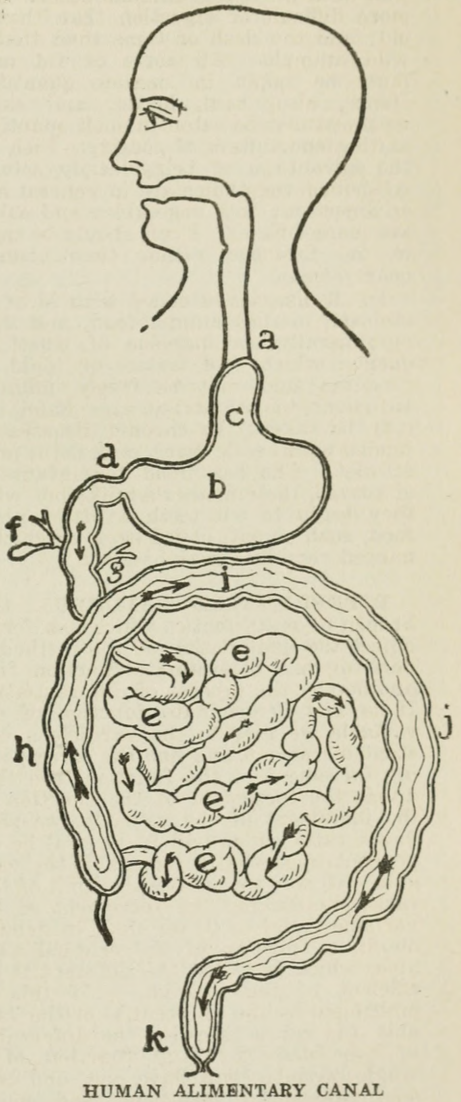
DIGBY, a small seaport of Nova Scotia, on St. Mary's Bay, reputed for its curing of a variety of small herrings or pilchards ("Nova Scotia sprats").

DIGBY, SIR KENELM, an English natural philospher; born in Gayhurst, near Newport Pagnell, July 11, 1603.

His father, Sir Everard Digby (1581-1606) in 1592 came into a large estate, but seven years later turned Catholic, and was hanged as a Gunpowder conspirator. A "Life" of him appeared in 1896. Kenelm himself was bred a Catholic, but in 1618, after a half-year in Spain, entered Gloucester Hall, Oxford (now Worcester College). At Madrid he fell in with Prince Charles, and, following him back to England was knighted, and entered his service. In 1625 he secretly married "that celebrated beautie and courtezane," Venetia Stanley (1600-1633). With two privateers he sailed in 1628 to the Mediterranean, and on June 11 vanquished a French and Venetian squadron on Scanderoon. On his beloved wife's death he withdrew to Gresham College, and there passed two hermit-like years, diverting himself with chemistry. Meanwhile he had turned Protestant, but, in 1636 he announced to Laud his reconversion; and his tortuous conduct during the Great Rebellion was dictated, it seems, by his zeal for Catholicism. He was imprisoned by the Parliament (1642-1643), and had his estate confiscated; was at Rome (1645-1647), and thrice revisited England (1649-1651-1654), entering into close relations with Cromwell. At the Restoration, however, he retained his office of chancellor to Queen Henrietta Maria. He was one of the first members of the Royal Society (1663), and died June 11, 1665.

DIGBY, KENELM HENRY, an English antiquarian; born in 1800, the youngest son of the dean of Clonfert, graduated from Trinity, Cambridge, in 1819, and in 1822 published "The Broad Stone of Honour" "that noble manual for gentlemen," as Julius Hare called it. It was much altered in the 1828 and subsequent editions, its author having meanwhile turned Catholic. He died in London, March 22, 1880. Of 14 other works (32 vols. 1831-1874) eight were poetry.

DIGESTION, the change which food undergoes in order to prepare it for the nutrition of the animal frame. It is carried on in the higher animals in the digestive system. In some of the lowest forms of animal life (amœbæ) which have no special organs, particles of food are drawn into the body and digested. In higher organisms there is a simple pouch which leads inward from the center of the cluster of tentacles; into this fish and other food are drawn and digested, while the undigested parts are afterward voided through the same aperture by which they entered. In still higher organisms, man himself included, this simple pouch is changed into a complex and greatly elongated tube, which is provided with one aperture (the mouth) by which food enters, and another aperture (the anus) through which undigested matter leaves the body. The mouth in most animals is



HUMAN ALIMENTARY CANAL

a. Œsophagus
b. Stomach
c. Cardiac orifice
d. Pylorus
e. Small intestine
f. Biliary duct
g. Pancreatic duct
h. Ascending colon
i. Transverse colon
j. Descending colon
k. Rectum

provided with hard tissues—teeth, beaks for the subdivision of food before it is swallowed. Vegetable feeders, eating tough grains, roots and fibers, have large molar or grinding teeth, while the carnivora have these same teeth modified so as

to present a cutting edge, with which and their pointed canines meat is torn and cut into pieces, which are then swallowed. Below, the cavity of the mouth passes into the gullet or œsophagus, and in front of this tube runs the windpipe. Food will pass through the pharynx, or the interior of the throat, into the gullet; and air, during respiration, passes through the pharynx on into the larynx and windpipe; a valve called the epiglottis partly closes the aperture of the larynx.

The gullet or œsophagus is a long tube passing from the pharynx to the stomach. Its mucous coat is loaded with very large glands which secrete a quantity of very viscid mucus. The stomach itself is a greatly dilated part of the digestive system. It may be said to consist of two parts, even in the human subject; a more complex arrangement is found in many animals, such as the ruminants. The large dilated portion into which the gullet opens is termed cardiac, and the opening the cardiac or œsophalageal opening. The whole is lined with mucous membrane, which, in the empty stomach, is thrown into projecting folds or rugæ, but these folds are effaced when the organ is distended with food. In the membrane are innumerable glands which secrete the digestive juices of the stomach. The gastric juice is acid, and the chief acid secreted is hydrochloric acid. The substance called pepsin which is necessary for digestion, is secreted by the whole of the glands.

The food now called the chyme passes into the small intestine, a tube about 20 feet long. This tube, besides the muscular and mucous coats, possesses an external coat of loose fibrous tissue, covered by a single layer of flat cells. This coat is prolonged into, and helps to form the mesentery, a membrane connecting the intestine with the abdominal walls. This membrane is called the peritoneum. The small intestine is somewhat arbitrarily divided into three portions—the upper (duodenum), the middle (jejunum), and the lower (ileum). The mucous coat contains glands very like the pyloric glands of the stomach, called Lieberkühn's follicles. They secrete the intestinal juice. In the duodenum one finds in addition highly branded glands called Brunner's. In both the mucous and submucous coats, and generally involving both layers, are found masses of tissue—lymphoid—similar to that found in a lymphatic gland. Their function is probably connected with the blood and the blood corpuscles. Collections of these solitary glands, forming oblong patches about two inches long, are called Peyer's patches. In addition to the follicles of Lieberkühn and the glands of Brunner, there are two very important glandular structures, the liver and the pancreas, which pour their digestive juices into the small intestine. The bile, which is the secretion of the liver, is formed continually by that organ, but the amount thus formed is influenced by the kind and quantity of food taken. The bile is to be looked upon not only as a digestive juice, but as a drain or channel of excretion, whereby effete and useless matter is removed from the body. The pancreas is very similar in structure to a salivary gland. It secretes the pancreatic juice which pours with the bile into the digestive system. The mucous membrane, of the small intestine contains, in addition to the structures already mentioned, little projections called villi. These are important absorbents. This property they share with the whole of the digestive system through any part of which, and especially through the walls of the stomach and small intestine, digested matter passes into the numerous blood-capillaries which form everywhere a dense network. The villi are peculiar, for each one contains in addition to blood-vessels a small lymph-vessel or lacteal. Nearly all the fat absorbed by the digestive system is taken up by the little cells of the villi, and passes on into the lacteals and thence to the blood.

The unabsorbed food, mixed with the various secretions we have mentioned, now passes into the large intestine, where both digestion and absorption go on, though to a less extent.

When food is taken into the mouth it is at once swallowed, unless it is in a solid form. In this case it is chewed into a convenient size for swallowing, for which purpose it is, in addition, mixed with the viscid saliva and juices of the mouth. Many animals can hardly be said to masticate; such are the carnivora (dog, cat, etc.), and they are not provided with grinding teeth.

As a result of mastication, the food is gathered in the form of a round moist bolus on the upper surface of the tongue. It is now ready to be swallowed. In the first place, it is pushed backward by the tongue and seized by muscles, many of which are attached to the hyoid bone.

There is a possibility that during swallowing the food may go the wrong way—*i. e.*, it may pass into the larynx and windpipe. It is prevented from passing into it by the elevation of the larynx which pushes its aperture against and under the back of the tongue, which at the same time is pushed backward. In addition, there is a valve called the epiglottis, which is pushed down over the larynx by the movement just described

and by muscular fibers, which act upon it for that especial purpose. The walls of the stomach and intestines are, like the gullet, provided with muscular fiber. An external layer passes in the length of the gut, and within this is a circular layer. These muscles contract slowly on stimulation, and are outside the domain of voluntary action. During the digestion they contract peristaltically, urging the food toward the rectum.

In many animals, such as the sheep, ox, and camel, the stomach consists of several cavities communicating with one another. In the ox and sheep the cardiac and the pyloric portions are each subdivided into two compartments. The cardiac part consists of a very dilated cavity, the paunch (rumen), into which the food is passed as soon as swallowed. In addition there is a smaller part, the reticulum (honeycomb) so called from the folds of lining mucous membrane which intersects, forming a reticulum. Thepyloric half is divided into two parts. The psalterium (maniplies), so called from the lamellated appearance of its mucous membrane, communicates with the last division, the rennet stomach (abomasum). Fluid passes either into the first, second, or third parts of the stomach, and thence on into the fourth. Solid matter, such as grass, roots, etc., passes either into the paunch or reticulum. This is mixed with the saliva swallowed with it, and in addition it is mixed with juices formed by the mucous membrane of these cavities. When the animal has finished feeding, it lies down and rumination commences. Due in part to the contraction of the abdominal muscles and diaphragm, the food is propelled in the form of rounded pellets from the paunch and reticulum up into the mouth. The pellets are there thoroughly masticated, and are returned in a pulpy condition to the stomach. Now, however, the food passes into the psalterium, and into the rennet stomach.

The most essential change which food undergoes in digestion is one of solution. Albumen, starch, fat, and other foodstuffs are insoluble in the circulating fluids of the body, and injected into the blood they would block up the smaller blood-vessels. During digestion these pass either into nearly allied chemical substances which are readily dissolved in water, or in the case of fat partly into a soluble soap and partly into a state of microscopically minute subdivision.

The digestion of food is brought about by the action of the saliva, the gastric, pancreatic, intestinal and other juices. These are mixed with the finely divided food by the movements of the alimentary canal. The digestive juices are in all cases secreted by the microscopic cells which line the various glands opening into the digestive system. The digestive ferments are not whole cells, they are the products of cells.

When food is passed into the stomach, secretion occurs. This too may result from mechanical irritation, as when through an opening (fistula) the mucous membrane is brushed with a feather. In all cases the stomach, pale before, becomes suffused with blood, and the gastric juice is poured out. The flow of the intestinal juice, the pancreatic juice, and bile all follow the stimulation of the mucous membrane, and in all cases the blood-vessels enlarge so as to give the cells a good supply of food, though, as we have seen, they themselves actually pass into a condition of activity as a result of the influence of special secreting nerves. Foods belong to four classes: (1) Proteids — albumens, globulins, etc.; *e. g.*, the white of egg, the chief constituent of meat, the gluten of bread. (2) Carbohydrates — starches, sugars, gums; *e. g.*, potato-starch, cane or grape sugar. (3) Fats and oils; *e. g.*, suet, marrow, olive oil. (4) Minerals; *e. g.*, water, table salt, iron, phosphates.

Some few substances are absorbed without being digested at all; they do not need to be. Such are water and the minerals, though even many of these undergo some change. Grape-sugar is absorbed and probably proteids too are often absorbed to some extent at least. Fat is profoundly modified during digestion, though not as the result of any digesting ferment. The saliva, of which about 30 ounces are secreted during the 24 hours, contains a ferment termed ptyalin, which is capable of turning a starch into a soluble sugar called grape-sugar, or, according to other observers, into another soluble sugar termed maltose. When the food has reached the stomach and the acid gastric juice has mixed with it, the saliva is unable to act and is probably killed. Any digested starch is subsequently converted into sugar when the food reaches the small intestines by the pancreatic juice.

When the food reaches the stomach it causes a reflex secretion of gastric juice. This is but slowly produced when insipid heavy food, such as coagulated white of egg, boiled meat, sago, etc., is eaten, but flows readily when soups, broths, and fluids containing salts and extractions in abundance are taken. The gastric juice, several pounds of which are secreted daily, is acid in reaction containing free hydrochloric acid. In addition lactic and butyric acids are formed during the progress of digestion.

Within the small intestines most of the food undigested by the stomach is rendered fit for absorption. This takes place through the issue of the mucous membrane; much of the sugar and peptones find their way into capillary blood-vessels. Absorbed products and notably fat globules, pass into the lacteals, and thence into the blood, circulating through the veins at the root of the neck.

DIGIT (a finger), a term applied to the 10 symbols of number, 0, 1, 2, etc., to 9; thus 305 is said to be a number of three digits. Numbers were originally indicated by the fingers, and hence the name. Astronomers use digit to signify a twelfth-part of the diameter of the sun or moon, and speak of an eclipse of seven digits, meaning that seven-twelfths of the diameter is covered. See NOTATION.

DIGITALIN, $C_{35}H_{56}O_{14}$, A glucoside found in the leaves of Digitalis purpurea (foxglove). It occurs as a white, amorphous powder, or in granular masses, almost insoluble in cold water, readily soluble in alcohol. Used in medicine as a heart stimulant, and in Bright's disease. It is claimed that the drug is not cumulative in its action, thereby differing from various preparations of digitalis leaves. In large doses it is poisonous, and in case of poisoning emetics should be given, followed by alcoholic stimulants or camphor.

DIGITALIS, a genus of plants belonging to the natural order *Scrophulariaceæ*. They are natives of Europe and western Asia. There are numerous species, all of them tall herbs. *D. purpurea* is the common foxglove. The dried leaves of the foxglove are used in medicine, as powder, infusion, or tincture, or in the form of the active principle, digitalin. *D. purpurea* belongs to the order *Scrophulariaceæ*, and is very useful in cases of heart disease. The powdered leaves or an extract of *D. purpurea, ochroleuca, lævigata, ferruginea*, and other species, in overdoses produce vomiting, vertigo, and other symptoms, followed even by death.

DIGITARIA, finger-grass, a genus of grasses so named from the digitate spikes. There are two species: *D. sanguinalis*, or cock's-foot finger-grass, and *D. humifusa*, smooth finger-grass.

DIGITIGRADA, a section of the order *Carnivora*, comprising the lions, tigers, cats, dogs, etc., in which the heel is raised above the ground, so that the animals walk more or less on the tips of the toes. The other two sections are the *Pinnigrada* and the *Plantigrada*. The section *Digitigrada* is divided into the families *Mustelidæ, Viverridæ, Canidæ Hyænidæ*, and *Felidæ*. The first two are aberrant, being semiplantigrade.

DIJON (dē-zhôn'), the chief town in the French department of Côte-d'Or, formerly capital of the old duchy of Burgundy, lies, spread out on a fertile plain at the foot of Mont Afrique (1,916 feet), at the junction of the Ouche and Suzon, and on the Canal de Bourgogne, 196 miles S. E. of Paris by rail. Its importance as a railway center has rendered it of consequence in the inner line of French defenses. On the death of Charles the Bold it came with Burgundy into the possession of France in 1477. In October, 1870, after a sharp engagement before the city, Dijon capitulated to a German force. There was again severe fighting here in January, 1871. Pop. about 75,000.

DIKE, or **DYKE**, a word variously used to represent a ditch or trench, and also an embankment, rampart, or wall. It is specially applied to an embankment raised to oppose the incursions of the sea or of a river, the dikes of Holland being notable examples of works of this kind. Laws concerning dikes are found in the old Saxon and Swabian codes. The ancient ordinances concerning dikes rest for the most part on the unwritten law or autonomy. The most important and complete code of regulations is the ordinance of the Duchy of Bremen of 1743. Of later ordinances the Prussian law of Jan. 28, 1848, and the so-called "Deich-ordnung" for the Duchy of Oldenburg, June 8, 1855, are notable. Owing to the possibility of great loss of property and of life, the punishment of all neglect or for malicious mischief to dikes is extremely severe. The dikes which protect the Netherlands and the German coasts of the North Sea go back to the old Roman times. Apparently even before the Romans appeared the Batavians at the mouth of the Rhine protected themselves by dikes. Drusus after the conquest of Holland, 10 B. C., built an elaborate system of artificial canals and dikes. Pliny the Elder gives interesting descriptions of the artificial hills, which were erected at places of refuge during the floods. In the 10th and 11th centuries the archbishops in Bremen summoned the native inhabitants to the building of dikes to protect the marshes of Bremen.

Among the provinces in north and south Holland which have been protected by dikes may be mentioned the province of Hanover, 618 miles, protecting 770,000 acres of marsh land. On the left bank of the Oder river there is a dike which

protects more than 170,000 acres of land. The dike at the delta of the Vistula protects 134,000 acres of land. On the lower Rhine, between the Wesel and Holland are 115,000 acres protected by dikes. Along the Loire river are 280 miles protecting 230,000 acres. Along the Po there are 310 miles protecting 850,000 acres. In England there are 1,750,000 acres protected by dikes.

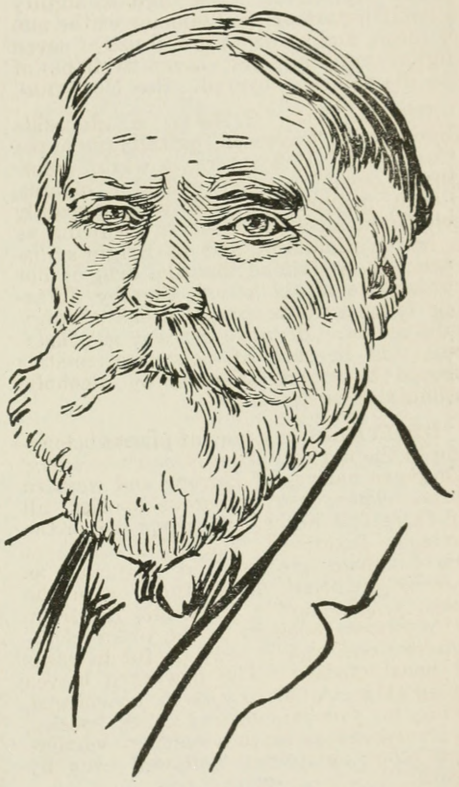
In the United States the term dike is almost wholly restricted to the structures of more or less permanence built in various ways in the bed of a stream to regulate its flow, narrow the low water cross section, concentrate the current, increase its local scouring effect and thereby deepen the river channel. The earthen embankments designed to restrain the flood waters are called levees. The most notable examples are found along the Mississippi river where it winds its way through the alluvial plain which it has built up below the mouth of the Ohio river. These levees are placed some little distance back from the river, and according to the local conditions vary in height from two or three feet to over 20 feet. In 1850 the General Government granted to some of the States certain public swamp lands, the revenue from which was to be used in levee building. With the exception of this aid from the United States, all levees up to 1882 were built by funds raised by local taxation of the lands to be benefited and administered by levee boards organized under State laws. Since 1882 the General Government has pursued the policy of aiding the local levee boards in raising and strengthening their levees.

DILKE, SIR CHARLES WENTWORTH, an English publicist and critical and political writer; born in London, Sept. 4, 1843. A brilliant but checkered political career has been varied by literary work: "Greater Britain" (1868), a record of travel in the English colonies; "Problems of Greater Britain" (1890), political and economic studies; and various essays on current topics, worthy in conception and charming in style. He died in 1911.

DILL (*Anethum graveolens*), a genus of plants belonging to the order *Umbelliferæ* or *Apiaceæ*. The seeds, or rather fruits, which are imported from the middle or S. of Europe, are oval, flat, and about a line and a half in length, with a pale membranous margin. They are stimulant and carminative, and furnish a pale-yellow aromatic oil. Dill-water is used as a remedy in flatulence and gripes of children, and the fruit to flavor pickles.

DILLENIACEÆ, an order of plants found chiefly in Australia, Asia, and the warm parts of America. They are nearly related to the *Ranunculaceæ*. The species are trees, shrubs, or under-shrubs. The Indian species are remarkable for their beauty, the grandeur of their foliage, and the magnificence of their flowers. They have astringent properties, and some of the species afford excellent timber. Lindley enumerated 26 genera, comprising 200 species.

DILLON, JOHN, an Irish politician; son of John Blake Dillon (1816-1866), who was a prominent member of the Young Ireland party, and member of the



JOHN DILLON

British Parliament for County Tipperary in 1865-1866; born in New York, in 1851; was educated at the Catholic University of Dublin, after which he became a doctor. He early identified himself with the Parnellite movement, and in 1880 was elected to Parliament for County Tipperary. In the House of Commons Dillon soon became prominent for the violence of his language, while speeches delivered by him in Ireland led to his imprisonment in 1881, 1881-1882, and 1888. From 1883 to 1885 he was absent

from political life on account of ill-health; but in the latter year he reappeared, and was elected for East Mayo. He was one of the most prominent promoters of the "Plan of Campaign." In 1896 he succeeded Justin McCarthy as chairman of the main section of the Nationalist party. In 1901 he accepted the leadership of John Redmond in the reconstituted nationalist party, and worked actively as his lieutenant.

DIMENSION, in algebra, a literal factor of a product or term; also called a degree; thus a^2b is an expression of three dimensions. A simple equation is said to be of one dimension. A quadratic of two, a cubic of three, and so on. In geometry, extension in a single line or direction. A line is extended in one direction, or has one dimension, that is length; a surface is extended in two directions, or has two dimensions, length and breadth; a solid is extended in three directions, or has three dimensions, length, breadth, and height or thickness.

DIMORPHISM, the power of assuming or crystallizing in two distinct forms. Sulphur, for instance, which usually crystallizes in the rhombic system when melted, may form monoclinohedric crystals. The same chemical substance may form two or even more distinct bodies or mineral species. Thus carbon in one form is the diamond, in another graphite; and carbonate of lime appears as calc-spar or as arragonite.

DINAN, a town in the department of Côtes-du-Nord, France, situated on the Rance, 15 miles S. of Saint-Malo. It has an old castle, the cathedral of St. Sauveur, and a valuable museum. The manufactures include agricultural implements, linen, wooden goods, barges, cider and sugar. The town has relics going back to the Romans. Pop. about 12,000.

DINANT, a town of Belgium, in the province of Namur. It is on the Meuse river. Prior to the World War it had many noteworthy buildings, including the church of Notre-Dame, and the city hall, which was once the palace of the princes of Liège. There were important manufactures, including paper mills, carpet factories, breweries, tanneries, etc. The city was notable for its production of metal ware and glass work. Dinant suffered severely during the German invasion of Belgium in 1914. Pop. about 8,000.

DINARIC ALPS, the name applied to the mountains connecting the Julian Alps with the Balkan system. The main range stretches from N. W. to S. E., separating Dalmatia from Bosnia and Herzegovina, as far as the mouth of the Narenta; and a minor chain extends through the Dalmatian coast country. The mountains are principally calcareous; the highest summits are Orjen (6,225) and Dinara (5,940), and the mean height is 2,300 feet.

D'INDY (PAUL MARIE THÉODORE), VINCENT, a French composer, He was born at Paris, 1851, and was educated in Paris schools, becoming a pupil of César Franck for musical composition, and chief of the choirs of the Concerts Colonne, 1874. He received the Grand Post for musical composition in 1885 and was the founder, with Charles Bordes, of the Schola Cantorum, of which he continued director after Bordes' death. He was professor at the Conservatoire and a member of the Commission de l'Enseignment musical of Paris. His publications include: "Franck," "Beethoven"; musical) "La Légende de Saint Christophe," a sacred drama, "Le Chant de la Cloche"; 3 symphonies; and other works.

DINGLEY, NELSON, an American legislator; born in Durham, Me., Feb. 15, 1832. He graduated from Dartmouth College in 1855; was elected to the State Legislature six times; was governor of Maine in 1874-1875; was elected to Congress in 1881, and was re-elected for seven terms. He was the author of the Dingley Tariff Bill of 1897, and a member of the Anglo-American Commission of 1898. He died in Washington, D. C., Jan. 13, 1899.

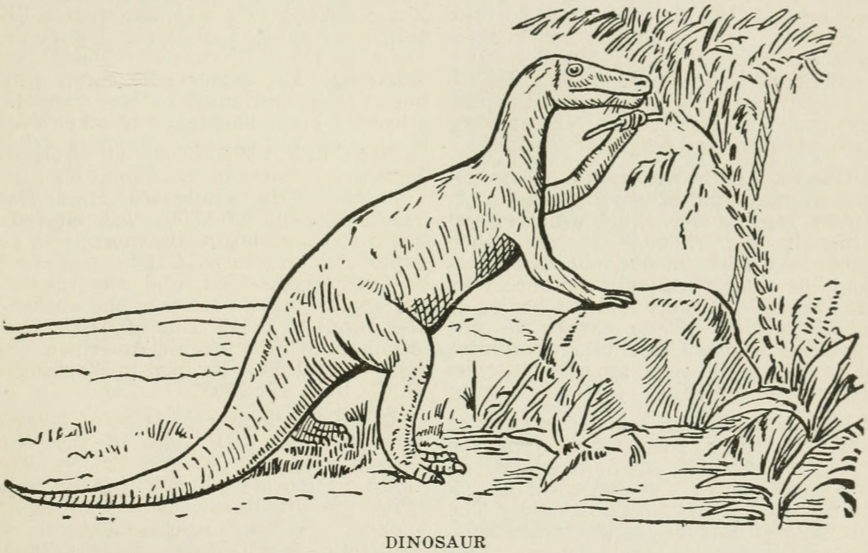
DINKA, a powerful tribe of Negritos who lived on both sides of the White Nile between lat. 6° and 12° N. Their territory covers 60,000 square miles. They are intelligent, have some skill in making articles for household use, and also follow agriculture. Each village is governed by its own chief.

DINOCERATA, an order of mammalia having on each of the four feet five well-developed toes, each terminated by a hoof. Three horn cores. No upper incisors; upper canines assuming the form of long tusks directed downward. The species are large mammals from the Eocene of North America. Professor Cope ranks the *Dinocerata* as an aberrant group of *Ungulata*, while Professor Marsh considers them a distinct order intermediate between the *Perissodactyle Ungulata* and the *Proboscidea*.

DINORNIS, or **DEINORNIS**, a genus of fossil birds, founded by Professor Owen, and published by him in 1839. Subsequent discoveries have brought to light several species of *Dinornis*, and some allied genera. *D. giganteus* was from 10 to 11 or 12 feet high; *D. stuthioides* was 7 feet, or the height of

an ostrich of moderate size; *D. dromioides* 5 feet, or that of the emu; and *D. didiformis* 4 feet, or between the cassowary and the dodo.

DINOSAURIA, a tribe or sub-order of reptiles established by Herman von Meyer in 1832, and subsequently called by him *Pachypodes*, or *Pachypoda*. In 1841 Professor Owen gave them the name which they still retain, *Dinosauria*. Huxley places them as one of two sub-orders under his order *Ornithoscelida*, and thus defines them: Cervical vertebræ short, femur as long as or longer than the tibia. Huxley divides them into three families: the *Megalosauridæ*, the *Sceiidosauridæ*, and the *Iguanodontidæ*.



DINOSAUR

DINOTHERIUM, or **DINOTHERE**, a genus of fossil mammals belonging to the order *Proboscidea* (Kaup, Huxley, and others), or to the order *Cetacea*, and the sub-order *Sirenia* (Blainville, Pictet, Carpenter, Dallas, and others), The *D. giganteum*, of which the entire skull and lower jaws were found in Miocene sand at Eppelsheim on the Rhine by Klipstein, and were described by Kaup, was apparently larger than the elephant. Its tusks, which projected from the lower jaw, curved downward, and were used by the animal, which was semi-aquatic, to support its head on the shore. It is believed that it had a short, flexible trunk.

DINWIDDIE, ROBERT, a British official and lieutenant-governor of Virginia in 1752-1758; born in Scotland, about 1690. During his official career he recommended the annexation of the Ohio Valley and the erection of forts to secure the W. frontier against the French. He was one of the most earnest supporters of the French and Indian War, which began about 1753 and lasted 10 years. He died in Clifton, England, Aug. 1, 1770.

DIOCESE, the territorial district or portion of the Church forming the spiritual jurisdiction of a bishop. Even as early as the New Testament history we find some plain indications of the rise of the diocesan system, in the cases respectively of James, Bishop of Jerusalem; Timothy, Bishop of Ephesus; Titus, of Crete; to whom may be added the angels or bishops of the Seven Churches in Asia. The name of diocese was not given till the beginning of the 4th century. Previous to that period they were denominated parochia.

DIOCLETIAN C. VALERIUS DIOCLETIANUS (surnamed Jovius), a man of mean birth, a native of Dalmatia, proclaimed Emperor of Rome by the army in 284 A. D. He defeated Carinus in Mœsia (286), conquered the Allemanni, and was generally beloved for the goodness of his disposition; but was compelled by the dangers threatening Rome to share the government with M. Aurelius Valerius Maximian. In 292 C. Galerius and Constantius Chlorus were also raised to a share in the empire, which was thus divided into four parts. Diocletian administered Thrace, Egypt, Syria, and Asia. As the result of his reconstitution of the empire the barbarians were driven back from all the

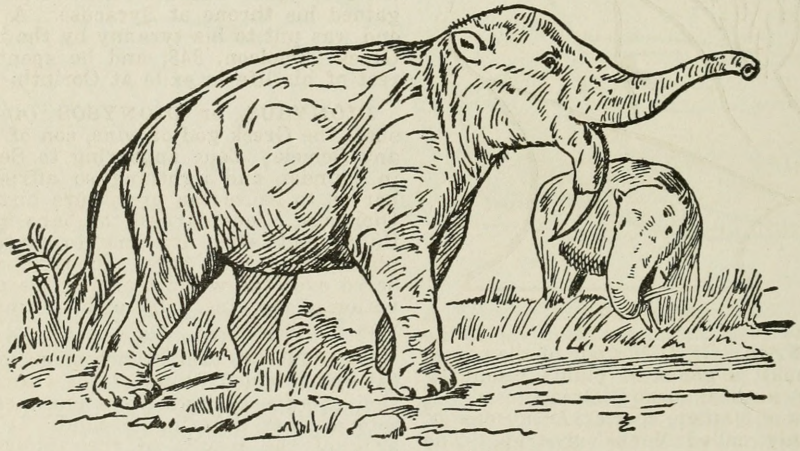
frontiers, and Roman power restored from Britain to Egypt. In 305, in conjunction with Maximian, he resigned the imperial dignity at Nicomedia, and retired to Salona in Dalmatia, where he died in 313. In the latter part of his reign he was induced to sanction a persecution of the Christians.

DIOCLETIAN, BATHS OF. See BATHS OF DIOCLETIAN.

DIODON, a genus of toleostean fish, family *Gymnodontes*, order *Plectognathi*, deriving their name from the fact that the ivory-clad terminations of the jaws show no suture, and the fish thus appear to possess but two teeth. The body, as in other members of the family, can be inflated with air till the creature floats on the surface of the water under side uppermost; it is likewise covered with ossifications in the skin. The rotundity of these fish has earned for them the name of globe-fish, or prickly globe-fish, and sea hedgehog. The four species of *diodon* are found in all the seas between the tropics, and range to the Cape of Good Hope. The largest species (*D. hystrix*) attains the length of two feet six inches.

DIOMEDEA (after Diomedes, one of the Greek warriors before Troy), a genus of birds belonging to the *Procellaridæ*, or petrels. *D. exulans* is the albatross.

DIOMEDE ISLANDS, a group of three small islands in Bering's Strait, and midway between Asia and America.



DINOTHERIUM

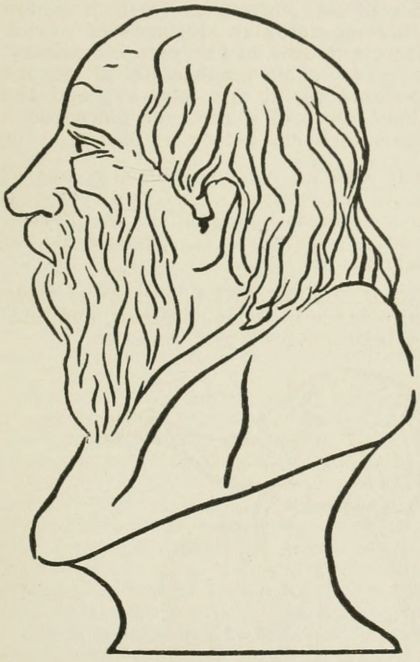
DIODORUS SICULUS, a native of Agyrium, in Sicily, who wrote a "Universal History" in 40 books, of which only 15 books and a few fragments remain. He flourished about B. C. 10.

DIŒCIOUS (dī-ē'shus), in botany, a term applied to unisexual plants, such as the willow and the hemp, in which the staminiferous and pistilliferous flowers are on separate individuals. In zoölogy, a term applied to those animals in which the sexes are distinct; that is, those in which the ovum is produced by one individual (female) and the spermatozoid by another (male). It is opposed to monœcious.

DIOGENES (dī-oj'ē-nēz), a celebrated Greek cynic; was a native of Sinope, in Pontus, where he was born 413 B. C. He was banished from his country for coining false money, and repaired to Athens, where he studied philosophy under Antisthenes. He walked about the streets with a tub on his head, in which it is said he lodged at night. Being on a voyage, he was taken by pirates and sold into slavery at Corinth, where he became tutor to the sons of a rich citizen, but died in the greatest misery, 324 B. C. The inhabitants of Sinope raised statues to his memory, and the marble figure of a dog was placed on a high column erected on his tomb.

DIOMEDES (dī-ō-mē'dēz), in Greek mythology, (1) a king of the Bistones, who fed his horses on human flesh, and used to throw all strangers who entered his territories to those animals to be devoured. He was killed by Hercules, who carried off the horses. (2) One of the heroes at the siege of Troy, the son of Tydeus and Deïpyle, and King of Argos, one of the suitors of Helen. After she was carried off Diomedes engaged in the expedition against Troy, in which his courage and the protection of Pal-

las rendered him one of the most distinguished heroes. He wounded Aphrodite and Ares, and thrice assailed Apollo; and by carrying off the horses of Rhœsus from the enemies' tents, and aiding Ulysses in the removal of Philoctetes from Lemnos, he fulfilled two of the conditions on which alone Troy could be conquered. Finally he was one of the heroes concealed in the wooden horse by whom the capture of Troy was at length accomplished. Different accounts were given of his after-life. He is often called Diomede.



DIOGENES

DIONÆA (Gr. *Diōnē*, one of the names of Venus), a genus of plants belonging to the natural order *Droseraceæ*. It consists of a single species, *D. muscipula*, commonly called Venus' fly-trap. The lamina is articulated to the pedicle, and consists of two portions united together by a joint along the midrib. On the upper side of each part of the lamina are situated three irritable hairs, which, on being touched, cause the folding of the divisions from below upward, so as to inclose any object. The food thus captured is digested by the action of a fluid resembling gastric juice. Venus' fly-trap is a native of the United States.

DIONYSIUS, a historian and critic of Halicarnassus, in Caria, who was invited to Rome about 30 B. C., and there wrote his "Roman Antiquities." Other works are "De Compositione Verborum," and the "Structure of Language." Lived in the 1st century, dying about 7 B. C.

DIONYSIUS I., the Elder, tryant of Syracuse; was born 430 B. C. He served in the war with the Carthaginians, got himself appointed general, and, in 405, sole emperor and head of the republic. He formed a powerful bodyguard, conquered other cities of Sicily, carried on war with the Carthaginians, and after making peace with them in 392, invaded Italy and subdued several of the Greek cities of the south. He was afterward again at war with Carthage. Dionysius, like some other tyrants, was a patron of literary men and artists, aspired to literary fame, and contended for the prize at the Olympic games. He erected many fine temples. He died in 367.

DIONYSIUS II., the Younger, tyrant of Syracuse, was son of the preceding, and succeeded him, 367 B. C. Idly brought up, he was for a time restrained from excesses by the influence of Dion and Plato. His subsequent treatment of Dion and his family led to his own overthrow in 356. He went to Italy and obtained the chief power at Locri, and after 10 years' absence returned and regained his throne at Syracuse. A final end was put to his tyranny by the noble Greek Timoleon, 343, and he spent the rest of his life in exile at Corinth.

DIONYSUS, or **DIONYSOS** (dī-ō-nī′sus), the Greek god of wine, son of Zeus and Semele. Zeus appearing to Semele in thunder and lightning so affrighted her as to cause the premature birth of Dionysus. Zeus carried the babe in his thigh, and when it came to maturity placed it in Ino's care. Dionysus wandered over the world teaching the cultivation of the vine. One of his surnames was Bacchus.

DIOPTRICS, that branch of geometrical optics which treats of the transmission of rays of light from one medium into another differing in kind. It consists of the results of the application of geometry to ascertain in particular cases the action of what are called the laws of refraction.

DIORITE, a granite-like rock, consisting of hornblende and albite. It is grayish-white to nearly black in color. It derives its name from being unmistakably or clearly defined, as distinguished from dolerite.

DIOSCOREACEÆ, a natural order of plants belonging to the class *Dictyogens*, consisting of twining shrubs. Lindley enumerates six genera and 110 species, *Testudinaria Elephantipes* is the tortoise

plant of the Cape, or elephant's-foot. *Tamus communis*, black bryony, is common in hedge-rows.

DIOSCURI (dī-os'kū-rī), the classical name for Castor and Pollux, twin brothers (Pollux being the son of Zeus) and tutelary deities of wrestlers, horsemen, and navigators. Their transplantation to the sky as one of the 12 constellations of the zodiac (the Twins) is a celebrated allegory of mythology. They are sometimes styled Tyndaridæ, because Tyndarus was the nominal father of both.

DIOSMA, a genus of plants, belonging to the *Rutaceæ* or rue family. They are small shrubs with white or red flowers; leaves alternate or opposite, simple. They are remarkable for their overpowering and penetrating odor, arising from the presence of a yellowish volatile oil. They are the Bucku plants of the Cape of Good Hope. The plant has been employed in chronic affections of the bladder and urinary organs in general, and has also been administered in cholera.

DIOSPYROS, a genus of plants belonging to the natural order *Ebenaceæ*. They consist of trees and shrubs, with white or pale yellow flowers. *D. lotos* is the Indian date plum, and is supposed by some to be the lotus of the ancients. The trees of several of the species furnish ebony wood. The fruit of *D. kaki* is occasionally brought from China as a dry sweetmeat, and *D. virginiana* is the date plum, the bark of which is employed as a febrifuge, along the Mississippi, in cases of cholera infantum and diarrhœa. A kind of cider has been made from this fruit, and a spirituous liquor distilled from its fermented infusion.

DIP, the inclination or angle at which strata slope or dip downward into the earth. This angle is measured from the plane of the horizon or level, and may be readily ascertained by the clinometer. The opposite of dip is rise, and either expression may be used, according to the position of the observer.

DIPHTHERIA, a contagious and (in its severe forms) malignant disease, caused by a specific bacillus and generally characterized by the formation of a fibrinous false membrane in the throat. Although previously observed, it was first clearly described in 1826 by M. Bretonneau of Tours under the name of "diphterite," as a form of very fatal sore throat occurring chiefly in children. It is now known that most cases of membranous croup are identical with diphtheria.

The period of incubation is usually from two to seven days. The disease begins by malaise, feeling of chilliness, loss of appetite, headache and more or less fever; soon the throat feels hot and painful and the neck is stiff and tender. If seen early, the throat is red and swollen, but a false membrane of yellowish or grayish color quickly appears in spreading patches, usually first on the tonsils, whence it often spreads to the pillars of the fauces, uvula and back of the throat, and may even extend down the œsophagus or gullet; extension of the membrane into the nasal cavities is a grave symptom. There is usually enlargement of the glands at the angle of the jaw, and albuminuria generally occurs at some stage of the disease. Diphtheritic membrane may be formed on any mucous surface, or even on a wound; if it extends into the larynx it gives rise to cough and difficulty in breathing. The throat affection is often accompanied by a low and very dangerous form of fever, with quick, feeble pulse and great and rapid loss of the patient's strength, which is still further reduced by the inability to take food; in other cases, the disease is fatal by paralysis of the heart or by suffocation, due to invasion of the larynx. Invasion of the larynx may necessitate intubation or tracheotomy. After the acute disease is over, the recovery may be delayed by paralytic symptoms of various kinds; or simply by extreme debility with exhaustion and loss of appetite. In the early stages of convalescence there is danger of sudden heart failure upon exertion.

Diphtheria is contagious. It may occur as a complication of scarlet fever, measles, and other infectious diseases. All gradations in the intensity of the disease from mild sore throat to septic and gangrenous forms occur. Damp and temperate climates seem to favor its development. Insanitary conditions favor its occurrence, but the disease may appear under the most favorable hygienic surroundings.

True diphtheria is now known to be caused by a specific bacillus called *bacillus diphtheriæ*, or the Klebs-Löffler bacillus. This bacillus was first recognized by Klebs in 1883 by microscopical examination of diphtheritic membranes, but it was first successfully cultivated by Löffler in 1884. Its causal relation to the disease was not thoroughly established till the investigations of Roux and Yersin in 1888, who demonstrated the existence of a peculiar and intensely poisonous substance known as the diphtheria toxin. It is now generally admitted that the Klebs-Löffler bacillus is the cause of true diphtheria. The diphtheria bacillus is a slender rod characterized especially by irregularities in shape and staining with aniline dyes.

The ways in which diphtheria bacilli may be conveyed from sick to healthy persons are almost countless. In ordinary breathing the expired breath contains no germs, but in speaking and especially in coughing, a fine spray is emitted which may contain the bacilli and thus convey the disease. All sorts of articles, such as handkerchiefs, toys, drinking utensils, furniture, clothing, bed-linen and the like, may become contaminated with the bacilli and be the means of spreading the disease. Hence, preventive measures, consisting in isolation of the patient till the bacilli have disappeared from the throat and in thorough disinfection, are of the first importance in checking the spread of diphtheria.

The discovery of the diphtheria bacillus has led to the introduction of a new and most successful method of treatment of the disease, known as serum-therapy or the antitoxin treatment. The establishment of the principles and the introduction of this treatment are due especially to Behring of Germany and Roux in Paris. The underlying principle of the treatment is based on the fact that, if a susceptible animal is inoculated first with small and then with increasing doses of the toxin produced by the bacillus, the blood of the animal is found to contain a substance called antitoxin, which has the power of neutralizing or rendering harmless the toxin. In order to obtain large quantities of the healing serum a horse is generally selected for the process of immunization. By proper methods very powerful antitoxins can be obtained. The antitoxin is used not only to cure the disease, but also to render persons insusceptible for a time to the disease. Dr. William H. Welch, of the Johns Hopkins University, in 1895, in an analysis of over 7,000 cases of diphtheria treated by antitoxin found that the fatality was reduced by this treatment by over 50 per cent of the previous death-rates. Since his report this conclusion has been confirmed and even more favorable results have been obtained.

DIPHTHONG, two vowel sounds, following one another so closely as to form but one syllable, as in out, where the sound is really composed of a and u. Many double vowels in English are not real diphthongs, there being only one sound heard, whereas some single vowels have a diphthongal sound. The only real English diphthongs are i as in high; i in aye; oi in boil; ow in how; and ew in mew.

DIPLODOCUS (dip-lod'ō-kus), according to Marsh, a saurian-footed, herbivorous dinosaur found in the American Jurassic deposits. The length of skull of this species was about 21 inches, of brain about 3 inches, and of body 50 feet. The animal is supposed to have been a hippopotamus-like wader, and to have lived on vegetation in the water.

DIPLOMA, a writing or document conferring some power, authority, privilege, or honor, usually under seal and signed by a duly authorized official. Diplomas are given to graduates of a university on their taking their degrees; to clergymen who are licensed to officiate; to physicians, civil engineers, etc., authorizing them to practice their professions.

DIPLOMACY, the science or art of conducting negotiations, arranging treaties, and carrying on other important business, between nations; the branch of knowledge which deals with the relations of independent states to one another, the agency or management of envoys accredited to a foreign court; the forms of international negotiations. The Cardinal de Richelieu is generally considered as the founder of that regular and uninterrupted intercourse between governments which exists at present between almost all the Christian powers. Diplomatic agents are of several degrees: (1) ambassadors; (2) envoys extraordinary and ministers plenipotentiary; (3) ministers resident; (4) chargés d'affaires; (5) secretaries of legation and attachés. Their rank was regulated in Europe in the above order, by the Congress assembled at Vienna in 1814.

DIPLOPIA, an affection of the sight, in which objects are seen double. It arises from derangement of the visual axis.

DIPLOPTERUS, a genus of fossil ganoid fishes, of four species, belonging to the Old Red Sandstone.

DIPLOZOÖN, a parasitic trematode worm which infests the gills of the bream, and which appears to be formed of two distinct bodies united in the middle, and resembling an × or St. Andrew's cross, two sexually mature individuals being thus united.

DIPNOI, an order of fishes, small in number, but of great importance as exhibiting a distinct transition between the fishes and amphibia. So many are the points of resemblance between the two, that until recently the *Lepidosiren* was always made to constitute the lowest class of amphibia. The highest authorities, however, now concur in placing it among the fishes. The order *Dipnoi* is thus defined: the body is fish-like in shape; there is a skull with distinct

cranial bones and a lower jaw, but the notochord is persistent, and there are no vertebral centra, nor an occipital condyle. The exo-skeleton consists of horny, overlapping scales, having the cycloid character. The pectoral and ventral limbs are both present, but have (in *Lepidosiren*) the form of awl-shaped, filiform, many-jointed organs of which the former only have a membranous fringe inferiorly. Until recently the only two members of the order were the *Lepidosiren paradoxa* of South America, and the *L. annectens* of Africa.

DIPPEL, (JOHANN) ANDREAS, an operatic singer and manager, born in Cassel, Germany, in 1866. He was educated in the public schools and for some time was engaged in business. He afterward studied music in Berlin, Milan, and Vienna. His first appearance was made in Bremen in 1887. After a successful career in Europe, he appeared in the Metropolitan Opera House in 1890. He later made concert tours throughout the United States. He sang at the Metropolitan Opera House from 1898 to 1910, at the same time acting as administrator and manager of the Chicago Grand Opera Company. He was the general manager of this company from 1910 to 1913 and was also manager of the same company in the years following. He died in 1919.

DIPPER, a genus of birds in the thrush family (*Turdidæ*), distinguished by an almost straight, compressed sharp-pointed bill, by the possession of a nostril valve, and still more by their peculiar manners and habits. They frequent clear, pebbly streams and lakes, feeding chiefly on mollusks and equatic insects and their larvæ. The dipper carries its rather short tail elevated after the manner of wrens, which it also resembles in the dipping of the head.

DIPPER, a name given to the seven stars in the constellation of the Great Bear, from their being arranged in the form of a dipper, or ladle.

DIPPING NEEDLE, a magnetized needle, moving in a vertical plane, on an axis which passes at right angles exactly through the center of gravity. When thus mounted it will, if placed anywhere not in the magnetic equator, dip or point downward. The position of the magnetic pole can thus be determined from the intersection of two or more lines formed by making experiments with the dipping needle at various places. The inclination or dip of the magnetized needle was not known to the Chinese, who had discovered its variation during the 12th century. This element of terrestrial magnetism appears to have been discovered by Robert Norman, a compass-maker of Ratcliff, London, who detected the dip, and published the fact in 1576. He contrived the dipping needle, and found the dip at London to be 71° 50′. Sir James Ross reached the magnetic pole, lat 70° 5′ 17″ N., and lon. 96° 46′ 45″ W., on June 1, 1831. The amount of dip was 89° 59′.

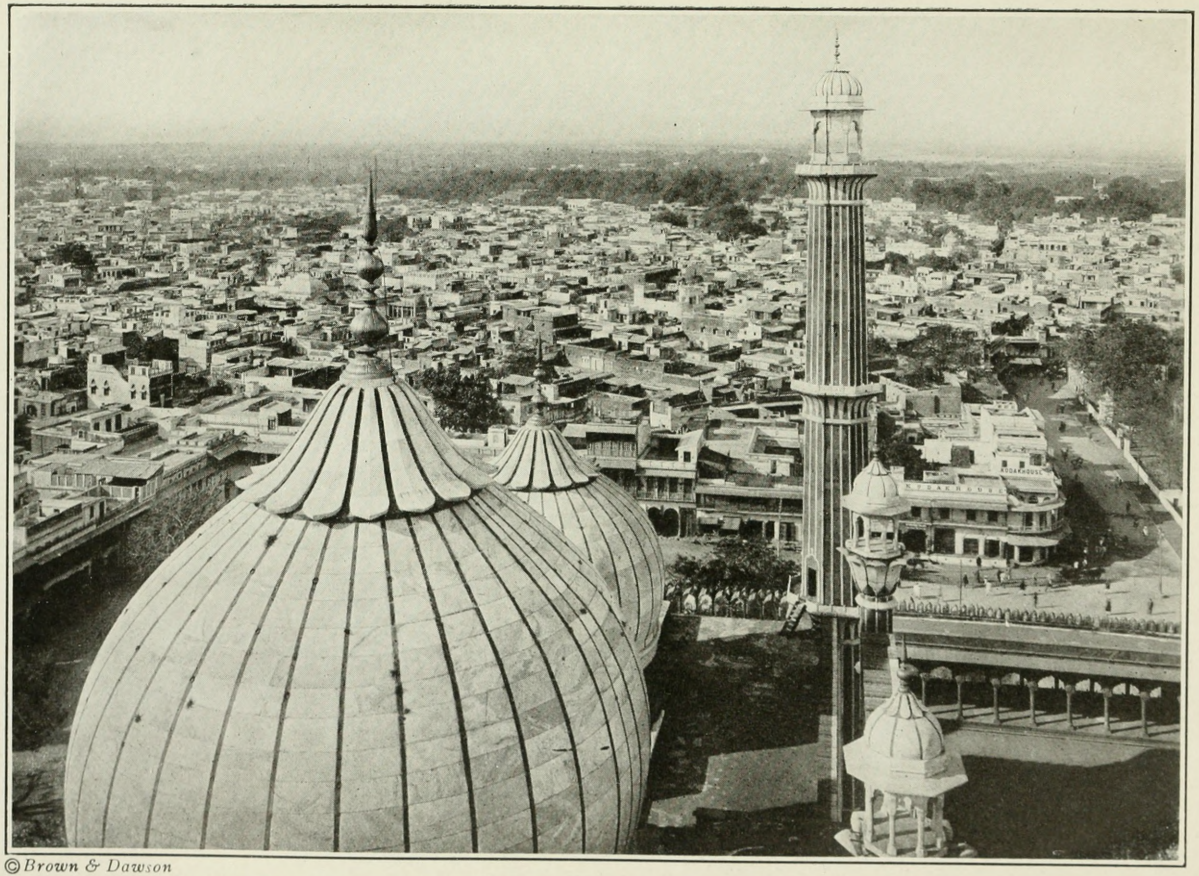
DIPROTODON, a gigantic pachydermoid marsupal mammal, resembling in most essential respects the kangaroo, the dentition especially showing many points of affinity. It is found in the Pleistocene or Upper Tertiary beds of Australia.

DIPSACEÆ, the Teazel family, a natural order of exogenous plants, consisting of herbs or undershrubs. They are found in the S. of Europe, the Levant, and the Cape of Good Hope. Lindley enumerates 6 genera and 160 species.

DIPSAS, a genus of non-venomous serpents of the family *Colubriformes*. They are nocturnal, arboreal animals, feeding chiefly on lizards, frogs and small birds, and are most abundant in neotropical and Oriental regions.

DIPSOMANIA, a term denoting an insane craving for intoxicating liquors, when occurring in a confirmed or habitual form. It is often of hereditary origin, but may result from sunstroke, from some injury to the brain, or from disease. The only remedy appears to be seclusion, with enforced abstinence and healthy occupation. Homes for this purpose have been established in Great Britain under the Habitual Drunkards Act of 1879. A number of corresponding institutions have long existed in the United States.

DIPTERA, an order of two-winged insects, of which the common house-fly and blue-bottle are familiar examples. They are characterized by a body with slight coriaceous coverings, a trunk open beneath, and containing a sucker composed of two, four, or six lancet-shaped elongated scales, two palpi, antennæ almost always composed of three joints, large eyes, an abdomen of four to seven distinct segments, tarsi with five joints, and two short clubbed appendages called halteres, or balancers, which seem to be the rudiments of the posterior pair in four-winged insects, and are kept in continual motion. All undergo complete metamorphosis, and all are oviparous except the *Sarcophaga*, which issue from their mother in shape of larvæ; and the *Pupipara*, which first make their appearance as nymphs.



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A BIRD'S-EYE VIEW OF DELHI, CAPITAL OF INDIA, LOOKING FROM THE TOP OF THE MOSQUE



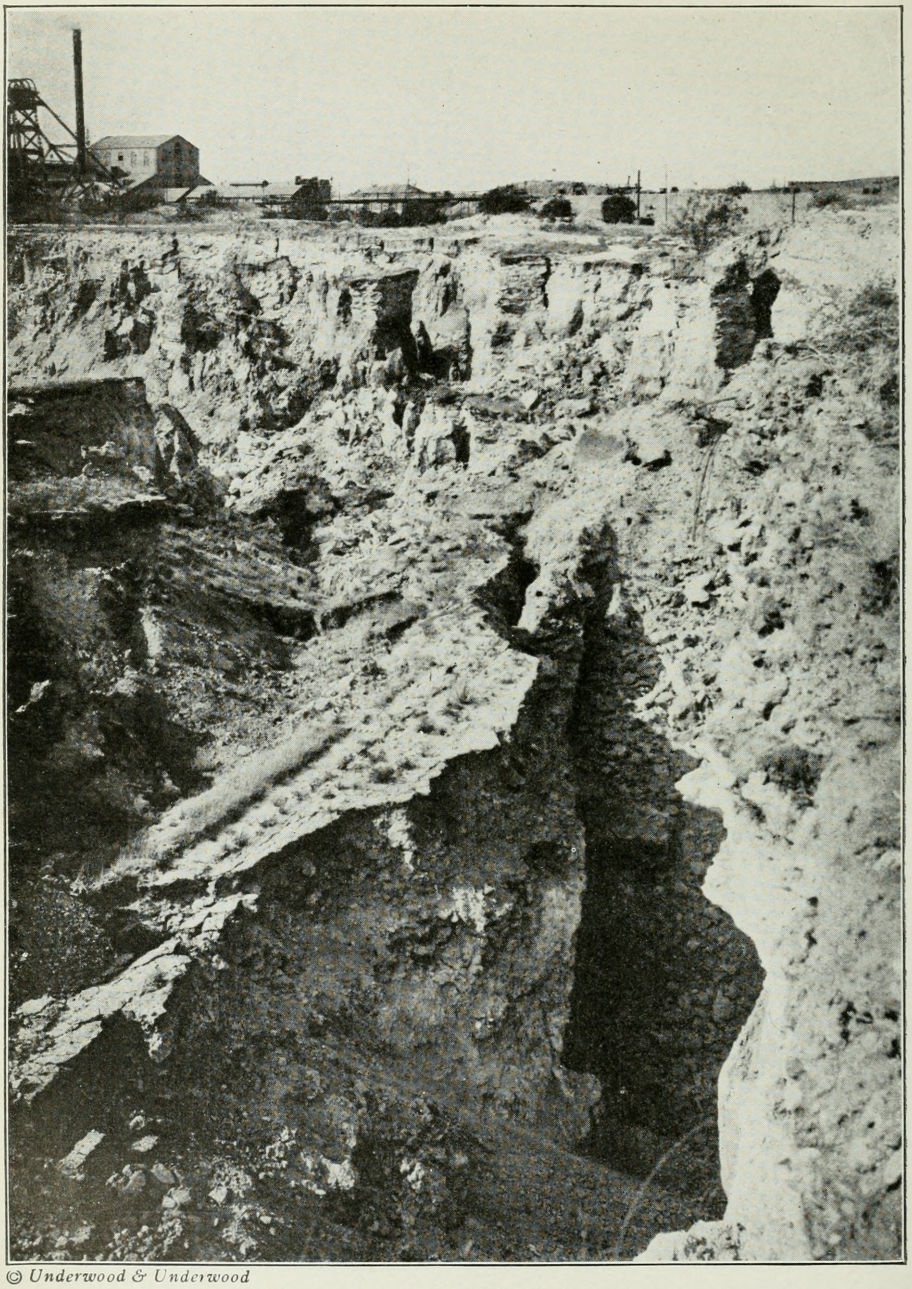
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A VIEW IN THE "STREET CALLED STRAIGHT," DAMASCUS



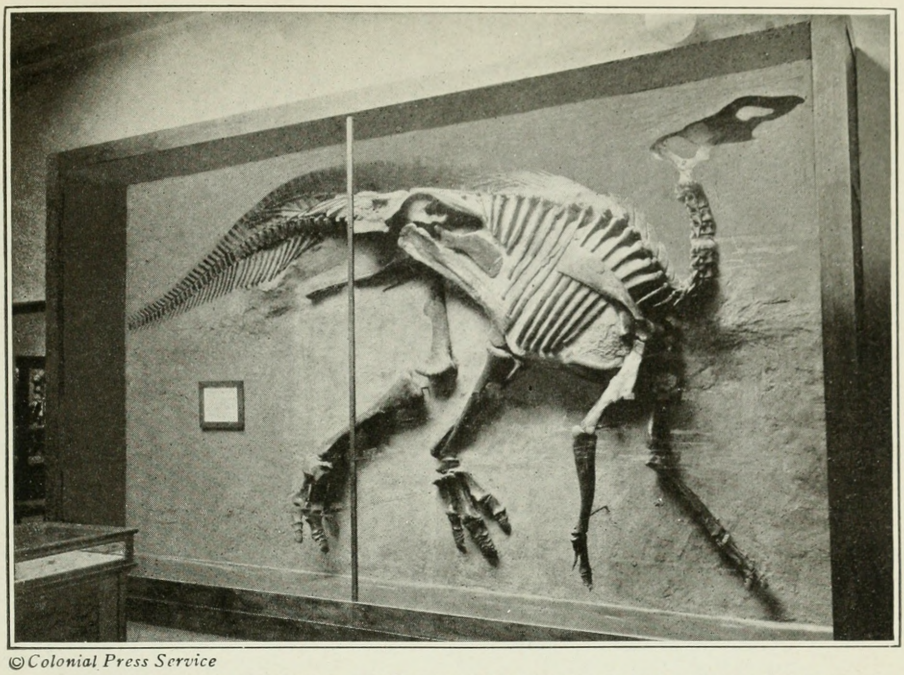
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A MERCHANTS' BAZAAR IN THE FAMOUS CITY OF DAMASCUS



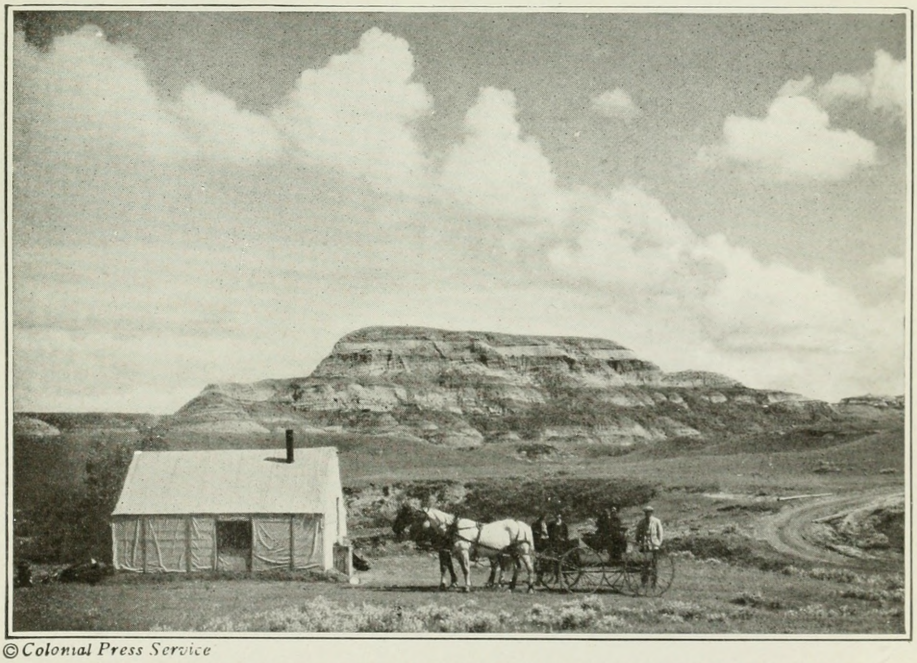
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DIAMOND MINING AT KIMBERLEY, SOUTH AFRICA



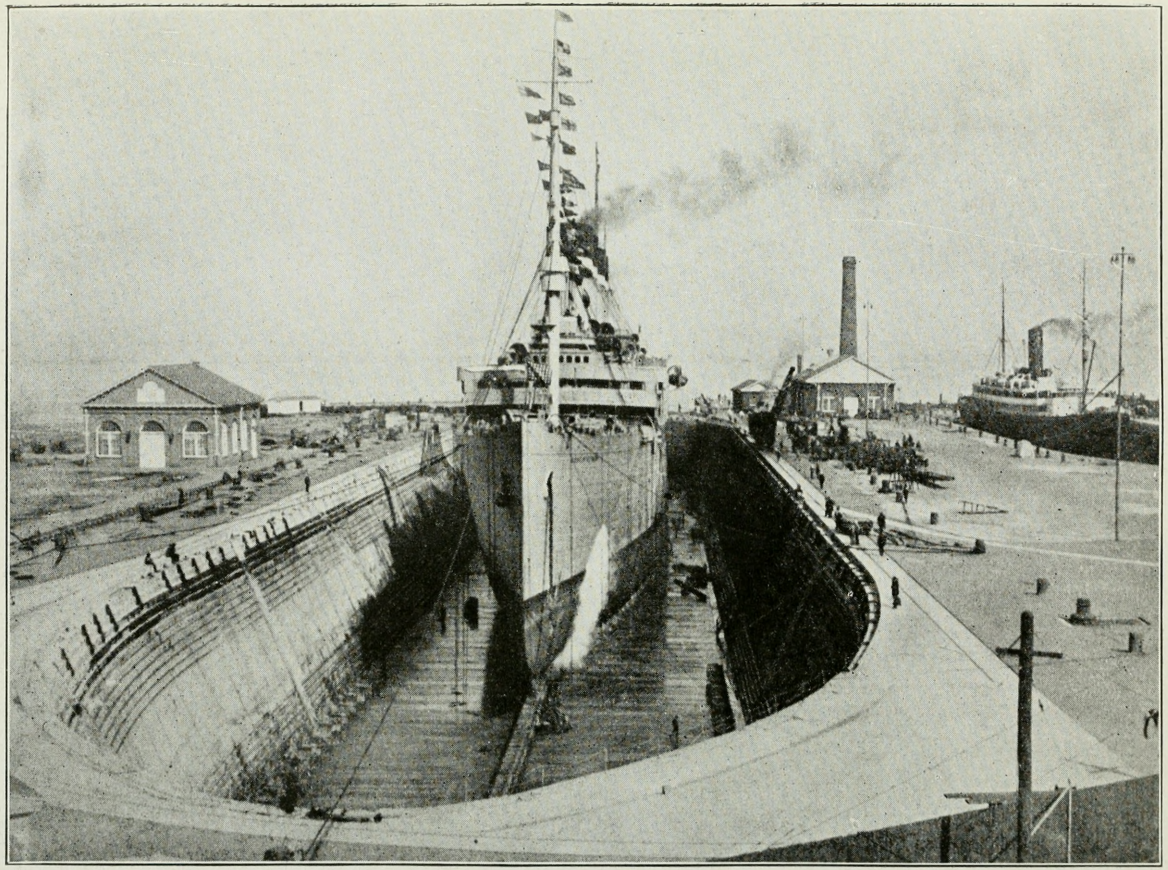
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SKELETON OF A DINOSAUR FOUND BY SCIENTISTS OF THE ROYAL ONTARIO MUSEUM



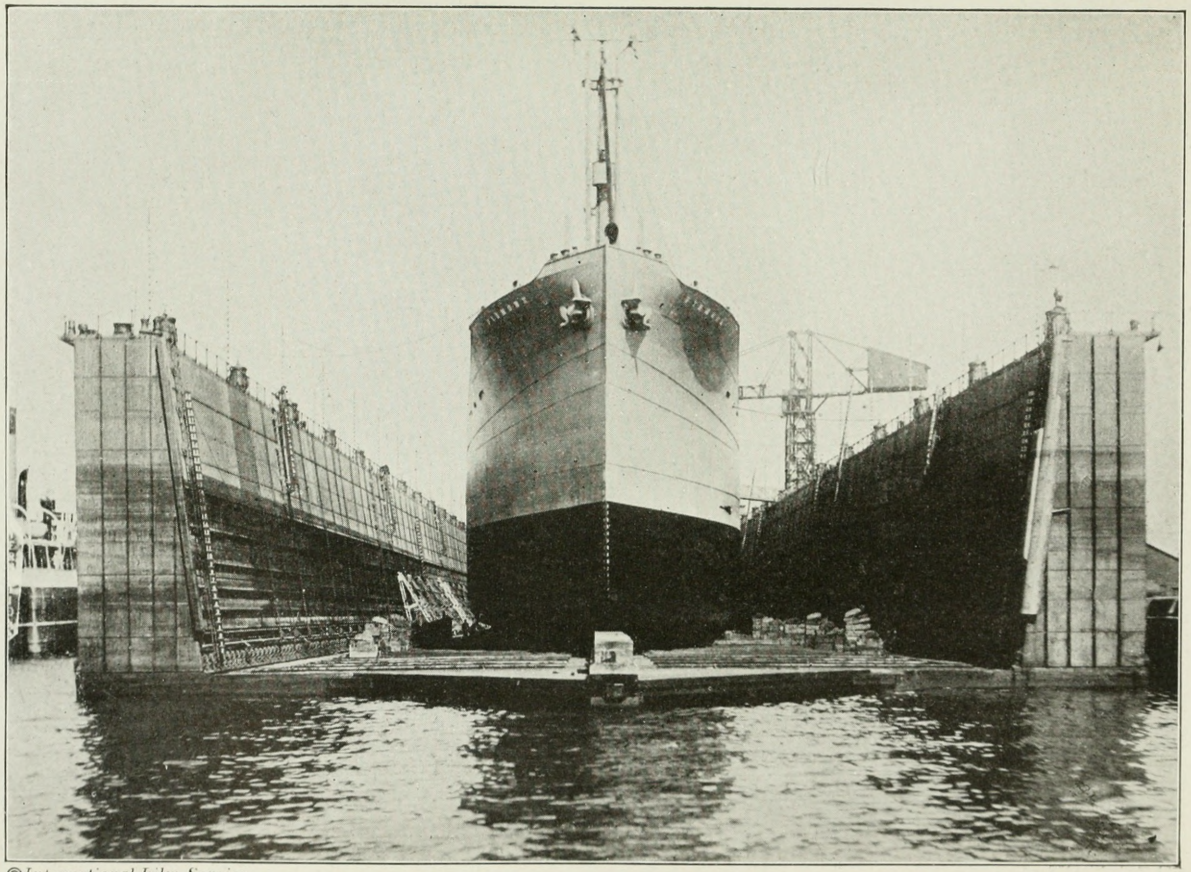
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THE RED DEER VALLEY, ALBERTA, WHERE SCIENTISTS ARE UNEARTHING SKELETONS OF THE DINOSAUR



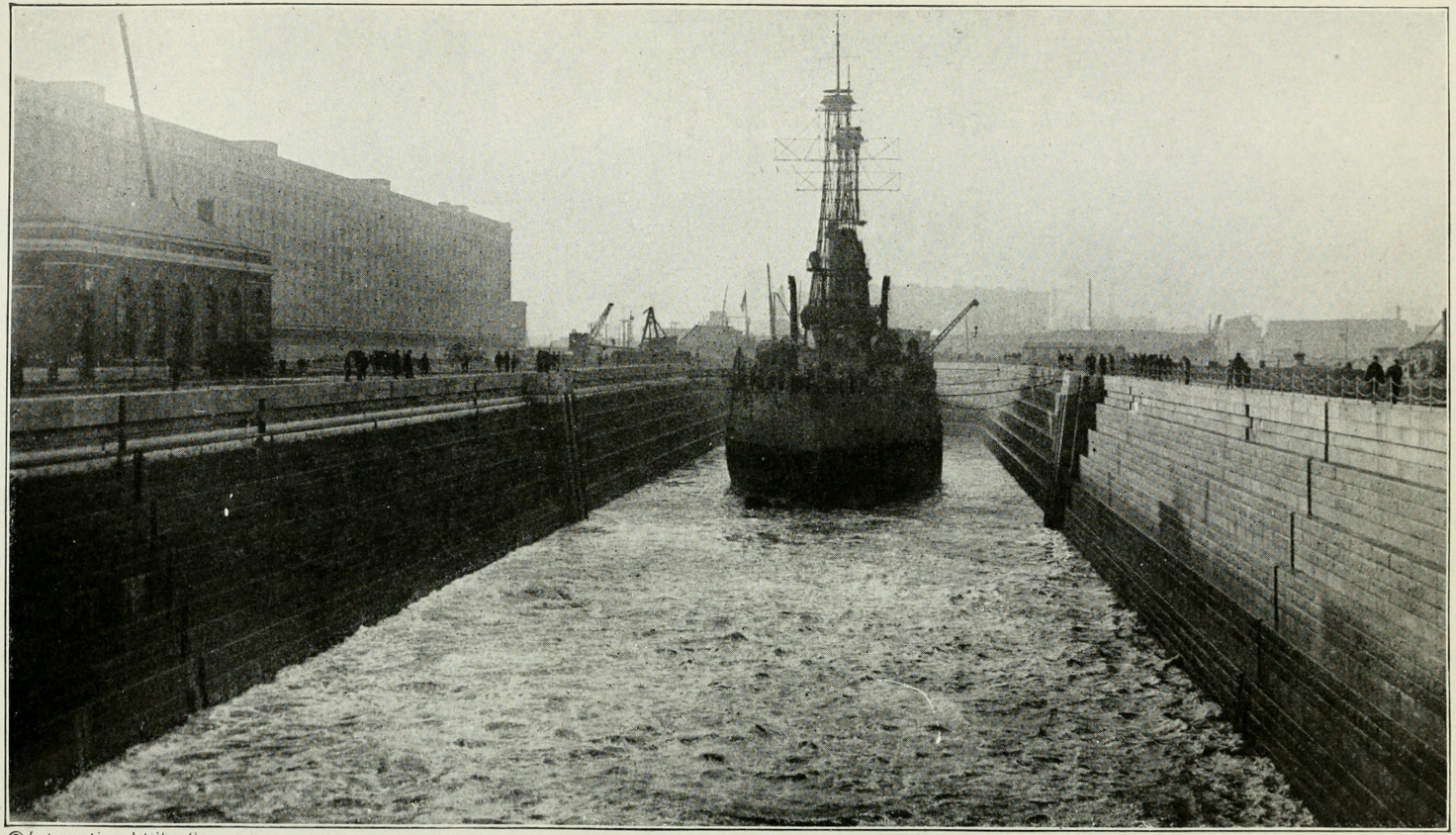
Photo, International Film Service

UNITED STATES TRANSPORT "MT. VERNON" IN DRY DOCK



©International Film Service

A FLOATING DOCK, WITH A VESSEL UNDERGOING REPAIRS



©International Film Service

THE BATTLESHIP "VIRGINIA" ENTERING THE GREAT DRY DOCK AT SOUTH BOSTON, MASS.

DIPTERACEÆ, or **DIPTEROCARPEÆ**, an important order of Asiatic exogenous polypetalous trees, allied to the mallows (*malvaceæ*). The different species produce a number of resinous, oily, and other substances; one, a sort of camphor; another, a fragrant resin used in temples; and others, varnishes; while some of the commonest produce pitches, and sal, valuable timber.

DIPTYCH (dip'tik), originally signified the same as diploma, something folded; the double tablets of metal, ivory, etc., used by the Greeks and Romans. Diptychs became important in the Christian Church, in them being written the names of Popes, and other distinguished persons, who had deserved well of the Church, to be mentioned in the Church prayers. Diptychs also often contained pictures of Biblical scenes.

DIPUS, the jerboas, a genus of rodents, the type of the family *Dipodidæ*. It includes about 20 species. *D. ægyptĭcus* is a native of northeastern Africa, Arabia, and southwestern Asia. It lives in burrows, and is generally gregarious. It is about six inches long, with a tail eight inches long, exclusive of the tuft at the end. Its upper surface is of a grayish sand color, the lower surface white, the tail pale yellowish above, and white beneath; the tip white, with an arrow-shaped black mark on the upper surface.

DIRECTORY, the name given to a body of five officers to whom the executive authority in France was committed by the constitution of the year III (1795). The two legislative bodies, called the councils, elected the members of the directory. By the revolution of the 18th Brumaire the directory and the constitution of the year III were abolished. It was succeeded by the consulate.

DIRECTRIX, in mathematics, a line governing the direction of another line. If a point so move that the distance from a given fixed point is to its perpendicular distance from a fixed straight line in a constant ratio, it describes a conic section of which the fixed straight line is termed the directrix, and the fixed point the focus. The constant ratio referred to is termed the eccentricity, and its magnitude determines the nature of the conic.

DIRGE, funeral music or hymn expressing grief or lamentation, usually played or sung at funerals or at services in memory of the dead. The word "dirge" derives its name from a Latin hymn beginning with "Dirige, Domine, Deus meus, in conspectu tuo viam meum." (Direct, O Lord, my God, my ways in thy sight.) John Milton's poem, entitled "Lycidus," is a well-known dirge.

DIRHEM, a modification of the Greek *drachma*, the name under the caliphs for a weight of silver equivalent to about 45 grains, and was also used for precious stones and medicine in Abrabia, Persia, Eygpt, and Turkey. As a coin the value varied, but may be given at 5½d. under the caliphs. In Turkey, the name dirhem has been given to the much smaller weight, the French gramme.

DIRK, a kind of dagger formerly used as a weapon of offense by the Highlanders of Scotland. Dirks are worn by midshipmen and cadets of the royal navy, and still form part of the full Highland costume.

DIRK-HARTOG ISLAND, on the W. coast of Australia, 45 miles long N. to S. and 10 miles broad.

DIRT-BEDS, a name given to certain dark-colored loam-like beds, which occur interstratified with Oölitic limestones and sandstones of Portland, England. They contain not only *Cycadeæ*, but also stumps of trees in an erect position, with their roots extending beneath them. Stems of trees are also found prostrate. Dirt-beds occur also in parts of the Mississippi basin.

DIS, the Roman equivalent of the Greek Pluto. It is akin to divus, and originally denoted merely godhead or deity.

DISC, an organ consisting of certain bodies or projections situated between the base of the stamens and that of the ovary, but constituting no part of either. The most common form is that of a fleshy ring, either entire or variously lobed, surrounding the base of the ovary, as in lamium, orobanche, etc. Sometimes it is a cup, as in pæonia.

DISCIPLE, literally, one who learns anything from another; and hence, the followers of any teacher, philosopher, or head of a sect. In this sense the word is sometimes used in Scripture, as when we read of the disciples of Moses, of John, of Christ. Generally, however, it is used with reference to the last of these—the followers of Jesus. Sometimes all who received the doctrines of Christ are called disciples. It is used as synonymous with apostle, and is applied to the Twelve.

DISCIPLES OF CHRIST, a denomination of Christians in the United States commonly known as the Christian Church, or Church of Christ, and sometimes called Campbellites. In September, 1809, Thomas Campbell, a Scotch minister of the seceders' branch of the Presbyterian

Church, then living in western Pennsylvania, issued a "Declaration and Address" deploring the divided state of the Church, and urging as the only remedy a complete restoration of apostolic Christianity and the rejection of all human creeds and confessions of faith. The Christian Association of Washington, Pa., was formed for the purpose of promoting the principles set forth in this "declaration." Mr. Campbell's son, Alexander, led the new movement. It was not the intention of the Campbells to form a distinct religious body, but to effect the proposed reforms in the Churches. Opposition forced them to act independently and the first Church was organized at Brush Run on May 4, 1811. The Disciples accept the Bible as their only rule of faith and practice. They reject infant baptism and adopt believers' immersion only. They observe the Lord's Supper each first day of the week, and practically accept and exalt the doctrine of the divinity of Christ. Their Church polity is congregational, though they frequently hold conventions in the interest of world-wide missions, but not for legislative purposes. They maintain college and numerous benevolent and educational organizations. They support missionaries in India, China, Japan, Africa, the Philippines, Cuba, Porto Rico, Mexico, Scandinavia, and Turkey.

In 1919, the Disciples of Christ throughout the world numbered about 1,400,000.

DISCO, an island on the W. coast of Greenland, under the parallel of 70° N. It is mountainous, reaching a height of 3,000 feet; has a total length of about 90 miles; and contains much excellent coal. The harbor of Godhavn is on the S. coast.

DISCOBOLUS, in classical antiquity, a thrower of a discus, or quoit; a quoit-player; specifically: the name given to the famous Greek statue of the quoit-thrower, preserved among the Townley Marbles in the British Museum. In ichthyology a name given by Cuvier to his third family of soft-finned teleostean fishes, having the ventral fins under the pectoral. The name is derived from the ventral fins forming a disk on the under surface of the body, by which the fishes are enabled to catch hold on the points of rocks.

DISCORD, in music, a combination of notes which produces a certain restless craving in the mind for some further combination upon which it can rest with satisfaction. Discords comprise such chords as contain notes which are next to each other in alphabetical order, and such as have augmented or diminished intervals, with the exception in the latter case of the chord of the sixth and third on the second note of any key. The changed combination which must follow them, in order to relieve the sense of pain they produce, is called the resolution. In fine arts, a term applied to paintings when there is a disagreement of the parts or coloring.

DISCOUNT, a deduction made in the payment of a bill or settlement of an account for ready or prompt payment; a sum deducted at a certain rate per cent. from the credit price of any article in consideration of prompt payment. The term discount is applied both to the amount deducted and the rate per cent. at which the deduction is calculated or allowed. Discount in banking is a charge made at a certain rate per cent. for the interest of money advanced on a bill or other document due at some future time. This charge the discounter deducts from the amount of the bill, handing over the balance to the borrower; a deduction from the present value of a security, the payment of which is postponed. The rate of discount depends on, and is regulated by, the market value of money.

DISCUS, DISC, or DISK, among the Greeks and Romans a quoit of stone or metal, convex on both its sides, sometimes perforated in the middle. The players aimed at no mark, but simply tried to throw the quoit to the greatest possible distance. It was sometimes furnished with a thong of leather to assist in the throwing. The throwing of the discus was a notable feature of the revival of the Olympian Games at Athens in 1896. In these games the discus-throwing event was won by Robert Garrett, of Princeton University, who far outclassed all the foreign competitors.

DISEASE, any alteration of the normal vital processes of the body under the influence of some unnatural or hurtful condition, called the morbific cause. If accompanied by change of structure, it is called organic or structurel; if not, it is said to be functional. The history of disease includes: (1) Symptomatology, or semeiology, the morbid phenomena or symptoms; (2) etiology, or causes of disease, the specific agents or causes generating or producing disease; (3) the special locality or seat of structural disease: (4) the nature and extent of morbid alterations, or lesions, or the stamps, anatomical signs, or evidence of its existence, in connection with its symptoms, causes, and course during life— morbid anatomy; and (5) morbid histology, or the elementary constituents of disease-products. There are usually three

periods: development, expression, and a series of intervals either tending to improvement, or confirmed conditions of ill-health, according usually as the disease is of the acute or of the chronic form. The form of disease may be neurotic, dynamic, adynamic, constitutional, malignant, hereditary, cutaneous, etc. The usual tendency of disease, from the *vis medicatrix naturæ*, is toward recovery.

DISEASE, GERM THEORY OF, the theory that certain enthetic diseases have their origin in vegetable germs that have found their way into the body and there undergo processes of growth which lead to chemical changes. The theory has been held with more or less distinctness for at least three centuries. To animalcules and micro-organisms were attributed diseases such as pleurisy, epilepsy, smallpox, the measles, syphilis, and malaria. The researches up to this time were, in 1762, summed up by Plenciz, a doctor of medicine in Vienna, who traced infectious maladies back to micro-organisms in the form of animate vegetable and animal forms. Decomposition was shown by him to be the result of the development of living organisms, which, it was suggested, had been transmitted through the air. Before Plenciz had made the results of his researches public, Needham had promulgated his theory of spontaneous generation, following which a line of physicians, as a result of investigation with instruments of ever-increasing accuracy, established the principle that life could only be engendered by previous life and that the germ theory alone was capable of explaining the general phenomena of certain diseases. These investigations disclosed that all germs were not harmful, and that they infected the air in infinite variety, entering the body through every available channel, the mouth, nose, throat, and gastro-intestinal canal. However, the body is provided with a strong defense against its numberless enemies in its covering of skin, the mucous membrane, the lymphatic glands, the phagocytes of certain cells, and the antitoxins in the fluids of the blood.

Observation of the action of certain germs shows that in diphtheria parts of the mucous membrane of the throat are destroyed, while in typhoid fever the intestinal ulcers are caused by the action of the typhoid bacillus. Other groups of bacteria result in the production of certain poisons which are distributed through the body by the circulation of the blood resulting in prostration and fever. While in regard to certain maladies the germ theory of their origin still remains only a theory, scientific knowledge of the relation has been established in respect to an ever-enlarging group, including such diseases as erysipelas, gonorrhœa, diphtheria, influenza, anthrax, actinomycosis, cholera, typhoid, tuberculosis, infantile spinal paralysis, tetanus, leprosy, malaria, pneumonia, syphilis, and relapsing fever.

Culture, cover-glass preparation and animal inoculation are the methods employed in modern bacterial examination, coagulated blood serum, Litmus milk, glucose agar-agar, potato agar-agar, and glucose gelatin are employed as culture media. In the technique employed in cover-glass preparation the pathological material is obtained during life and streaked over cover-glass, and after certain processes of heating to fix it, is placed under the microscope and examined. In animal inoculations the material is inserted or injected under the skin of a mouse or guinea pig, the progress of the malady is watched; and after death autopses of the organs are made. The presence of tuberculosis is ascertained by examination of the sputum by cover-glass preparation, and by parallel methods the bacillus of diphtheria, the plasmodium of malaria, and the germs of other diseases are indicated.

DISEASES OF THE EAR. See EAR.

DISESTABLISHMENT, the act of causing to cease to be established; specifically a depriving a Church of its rights, position, or privileges as an established Church; to withdraw a Church from its connection with the state. A bill for the purpose described was introduced into the British House of Commons by Mr. Gladstone on March 1, 1869. The second reading was carried on the 24th by 368 to 250 votes, and the third on May 31, by 361 to 247. The first reading took place in the House of Lords on the motion of Earl Granville, on June 1, 1869, and after several vicissitudes and some modifications the bill was accorded by the Commons. It received the royal assent on July 26, 1869, but it was provided that it should not take effect till Jan. 1, 1871, which, therefore, is the proper date of the disestablishment of the Irish Church. In 1914 an act providing for the disestablishment and disendowment of the Church of England in Wales was passed by Parliament, but its enforcement was postponed until after the World War.

DISHONOR, in commerce and banking, a default of payment. If, when a bill is presented for acceptance, the person on whom it is drawn refuses to

accept it, or if, when presented for payment, the acceptor refuses to pay it, or if a promissory note is not paid when it falls due, such default is termed dishonor; and the holder of the bill or note is bound to give notice to the parties who drew the bill or note or to those who have negotiated it. This notice is called notice of dishonor or protest, and if the holder fails to give notice of the same, the parties who would otherwise have been responsible are discharged from their liability.

DISINFECTION, the act of purifying from infectious and contagious matter. Agents which can destroy the specific poisons of infectious diseases and prevent them from spreading are called disinfectants. The action of disinfectants is therefore analogous to that of antiseptics, and conists of the destruction of low forms of life.

Thermal and chemical means are used in disinfection. Hot air and steam are included in thermal disinfection, while chemical disinfection destroys the infective particles by applying substances of a chemical nature. Heat, and especially fire, is the best disinfectant. Clothing which can be boiled without injury is thereby deprived of infectious germs. When heat cannot be applied, gaseous or liquid disinfectants are used. Cold is a natural disinfectant. The first frost kills an epidemic of yellow fever; but a temperature of zero does not kill the infection of anthrax, typhoid, tuberculosis, or smallpox.

Most large European cities have disinfecting stations under the direction of the health authorities. Disinfecting ovens are now replaced by cylinders or chambers, into which steam at a temperature of 220° to 230° F. with a pressure sufficient to prevent any disposition to moisture in the chamber should be so admitted as to drive out all air from the interstices of the infected articles, as well as from the chamber, thus insuring penetration into the interior. Among the most important disinfectants for practical purposes are chlorine, carbolic acid, sulphurous acid, Condy's green and red fluids, containing respectively manganate and permanganate of potash, and Burnett's fluid, containing chloride of zinc. Carbolic acid is one of the most effective, needing, however, some care in the handling, as it sometimes causes severe burns. As a deodorizer carbolic acid is not so energetic as chlorine and permanganate of potash; but there is this great difference, that while the acid destroys organic substances which give rise to offensive odor, the others mainly attack the odor itself and therefore require to be applied frequently if perfect sweetness is desired. The vapor of carbolic acid is not a disinfectant at ordinary temperatures, as bacilli are not destroyed, even when exposed to it for six weeks. It is therefore evident that the mere exposure of that substance in vessels is of no service in disinfecting a room. Sulphurous acid has long been in repute, both in the form of solution and in the gaseous state. Recent experiments on cultivated bacilli seem to prove that, while in the liquid state it is a powerful dsinfectant, it has little action either as dry gas or along with watery vapor. Of all the long list of popular disinfectants, chlorine, bromine, iodine, osmic acid, potassium permanganate (Condy's fluid), and corrosive sublimate seem to be the most certain and rapid in their action, but all of these are more or less open to objection. For application to the skin Condy's fluid is one of the readiest preparations. In cases of contagious or infectious disease, disinfectants such as chlorinated lime or carbolic acid should be used at once, being placed about the house, especially in the sick room and in the passages and landing outside of it. Every article of clothing and furniture should be carefully treated, as the germs may lurk in them and break out after a lapse of months or years.

DISLOCATION, a surgical term applied to cases in which the articulating surfaces of the bones have been forced out of their proper places. The particular dislocation takes its name either from the joint itself or its farthest bone, and is called compound when accompanied with an external wound. The most common dislocations are those of the hip, shoulder, elbow, knee, and ankle, and the chief obstacle to their reduction is the spasmodic and violent contraction of the muscles consequent upon them, the application of considerable force being often necessary to set the joint. Chloroform is of great use, not only in preventing pain but in relaxing the muscles. The most dangerous dislocations are those of the bones of the spine. In geology it signifies the displacement of parts of rocks or portions of strata from the situations they originally occupied.

D'ISLY, DUKE, real name T. R. Bugeaud, a marshal of France; born 1784.

DISMAL SWAMP, a large tract of marshy land, beginning a little S. of Norfolk, Va., and extending into North Carolina; containing 150,000 acres; 30 miles long, from N. to S., and 10 broad.

This tract was entirely covered with trees, with almost impervious brushwood between them, but it has now in part been cleared and drained. In the midst of the swamp is Drummond's Lake, seven miles in length, the scene of Thomas Moore's "Lake of the Dismal Swamp." In 1899, the Dismal Swamp canal, connecting Chesapeake Bay with Albemarle Sound, which from about the beginning of the 19th century to the close of the Civil War was a famous historic waterway, was reopened for navigation. It extends from the village of Deep Creek, Va., to South Mills, N. C., a distance of 22 miles; and is one of the most important links in the chain of inland waterways extending along the coast from New York to Florida. A marked advantage of the restored canal is that it enables shipping to avoid the dangers of Cape Hatteras; another is that it furnishes the means of inland and protected navigation for the smaller vessels of the navy and the revenue service. Although only 22 miles long it opens up 2,500 miles of inland navigation.

DISMAS, ST., the name of the penitent thief according to mediæval legends.

DISPENSATION, the act by which an exception is made to the rigor of the law in favor of some person. The Pope may release from all oaths or vows, and may sanction a marriage within the prohibited degrees of the Mosaic law, or exempt from obedience to the disciplinary enactments of the canon law. In England the monarch claimed, in former times, a similar dispensing power in civil law, but the prerogative was so much abused by James II. that it was abolished by the Bill of Rights. The power of commuting sentences in capital cases is the only form in which the dispensing power still exists. In ecclesiastical matters a bishop may grant a dispensation allowing a clergyman to hold more than one benefice, or to absent himself from his parish. Dispensations were first granted by Pope Innocent III. in 1200, and, being paid for, became a source of considerable revenue to the Holy See. Appeal to them on the part of English subjects was rendered illegal by 25 Henry VIII., c. 21, passed in 1533. A certain dispensing power was continued to the Archbishop of Canterbury, and an ordinary bishop can still dispense with the law of the Church in many cases.

DISPERSION, the decomposition of light, passing through a prism or anything similar, into the rainbow colors; or the angle of separation of two selected rays, say the red and the violet produced by a prism.

DISRAELI, BENJAMIN. See BEACONSFIELD.

D'ISRAELI, ISAAC (diz-rā'li), an English essayist, compiler, and historian; father of Benjamin; born in Enfield in Middlesex, May, 1766. He was of Spanish-Jew stock, but left the Jewish communion. Rejecting a career or trade, he frequented the British Museum and compiled the "Curiosities of Literature," in 1791. The author presented the copyright to the publisher, but bought it back a few years later on its remarkable success; it is still republished. A series of like collections followed, with the same success: "Calamities of Authors," "Quarrels of Authors," "Miscellanies, or Literary Recollections." He wrote some unsuccessful romances; among them is "Mejnoun and Leila," probably the earliest Oriental romance in the language. His "Commentaries on the Life and Reign of Charles I." marked a distinct advance in the methods of historical research. He died Jan. 9, 1848.

DISRUPTION, the name commonly applied in Scotland to the act by which, in 1843, 474 ministers and professors of the Established Church gave up their livings to vindicate principles which they held to be essential to the purity of the Church, and in harmony with its earlier history.

DISSECTION, the act or science of cutting up or dissecting an animal or vegetable body for the purpose of examining the structure and use of its several organs and tissues; the dissection of the human body for purposes of science was ordered by Ptolemy Philadelphus in the college of Alexandria. He even authorized the vivisection of criminals condemned to death. Herophilus of Cos was among the first of the professors in this great school of medicine.

DISSENTERS, the common name by which in Great Britain all Christian denominations, excepting that of the Established Churches, are usually designated, though in acts of Parliament it generally includes only Protestant dissenters, Roman Catholics being referred to under their specific name. The Nonconformists were dissenters from the English Church.

DISTAFF, a cleft stick about 3 feet long, on which wool or carded cotton was wound in the ancient mode of spinning. The distaff was held under the left arm, and the fibers of cotton drawn from it were twisted spirally by the

forefinger and thumb of the right hand The thread, as it was spun, was wound on a reel, which was suspended from and revolved with the thread during spinning.

DISTICH (dis'tik), a couplet of verses, especially one consisting of a Latin or Greek hexameter and pentameter, making complete sense.

DISTILLATION, an important process in the arts; consisting essentially in converting a liquid into vapor in a closed vessel, by means of heat, and then conveying the vapor into another cool vessel, where it is condensed again into a liquid. When applied to a solid the process is called sublimation. The object of distillation is to separate one substance from others with which it may be mixed. In distillation proper no chemical decomposition takes place; when any of the substances are decomposed it is called destructive distillation. Destructive distillation is the term applied to the process of heating vegetable and animal substances in retorts or similarly closed vessels at a temperature sufficient to decompose the original substance, and to obtain therefrom products possessing different properties from the material which yielded them. Examples of this process are the heating of coal in gas-works at a red heat, when it resolves itself into coke, which is left in the retort, and coal-gas, naphtha, tar, etc., which distill over into suitable receivers.

DISTILLED WATER, pure water obtained by distillation, H_2O. The water, if it contains suspended impurities, should be first filtered. The soluble impurities are either volatile or fixed. Of the water which comes over first about one-tenth should be rejected, as it contains nearly all the volatile impurities. The worm should be of block tin, silver, or platinum, as steam acts on glass, dissolving out alkaline silicates. Care should be taken to prevent the mechanical spurting of the liquid; one-tenth of the water should be left in the retort; the solid impurities are also left. It should be redistilled to get rid of traces of organic matter, after it has been treated with a little caustic potash and permanganate of potassium, to oxidize the organic impurities. If it still contains traces of ammonia it should be again redistilled over $KHSO_4$ to fix the ammonia. Distilled water is used in chemical analysis, and ought always to be used in preparing medicines.

DISTINGUISHED SERVICE ORDER, an order instituted by Queen Victoria on Sept. 6, 1886, for the reward of naval and military service. Foreign officers who have been associated in naval and military operations with British forces are eligible to be honorary members, and the order ranks next to that of the Indian Empire. The badge is a gold cross enameled white, edged gold, with the imperial crown on one side and the cipher V. R. I. on the other, each inclosed in a laurel wreath.

DISTRIBUTION, in political economy, the method in which the products of industry are shared among the people concerned. The methods of distribution have varied and do vary in accordance with the state of social development. They depend on legal as well as on economic conditions. They depend mainly on the ideas and institutions which prevail with reference to property in the three requisites of production—viz., land, labor, and capital. In countries where slavery prevailed, the slaveholder, as the owner alike of land, labor, and capital, disposed at his pleasure of the entire product of industry. Under the feudal system, by which the cultivator was attached to the soil and had a fixed interest in it, he was obliged to render to his superiors dues in labor, in kind, and latterly in money, which were fixed by custom or authority.

Whatever the arrangements regarding property and the distribution of the fruits of industry may be, account must be taken of the share claimed by the government in the form of taxes, for the maintenance of army and navy and other means of defense, for justice and police, and for education, etc. Some sections of the so-called professional classes are from this source paid for services rendered to the state. But the clerical and teaching professions derive their income more or less from corporate property, while the legal and medical professions obtain their share of the distribution mostly from the services they render to private individuals.

DISTRICT, CONGRESSIONAL, in the United States, a division of a State according to its population, sufficient in size to entitle it to a representative in Congress. The ratio of representation is established by Congress every 10 years, and is based on the total population as reported by the last preceding census. This is in accordance with the provisions of the United States Constitution (Art. 1, Sec. 2), which further declares that the number of representatives shall not exceed one for every 30,000; and, lest some State might have less than the required population, that each State shall have at least one representative. The action of the Federal

Government ceases with the fixing of the rate, and each State establishes the boundaries of its own districts by an act of its Legislature. There is, therefore, a decennial change in the number and often in the boundaries of the districts.

The ratio of representation in the United States House of Representatives based on the different censuses was as follows:

From 1789 to 1793 as by the U. S. Constitution.....		30,000
From 1793 to 1803 based on the U. S. Census of.....	1790	30,000
From 1803 to 1813 based on the U. S. Census of.....	1800	33,000
From 1813 to 1823 based on the U. S. Census of.....	1810	35,000
From 1823 to 1833 based on the U. S. Census of.....	1820	40,000
From 1833 to 1843 based on the U. S. Census of.....	1830	47,700
From 1843 to 1853 based on the U. S. Census of.....	1840	70,680
From 1853 to 1863 based on the U. S. Census of.....	1850	93,425
From 1863 to 1873 based on the U. S. Census of.....	1860	127,381
From 1873 to 1883 based on the U. S. Census of.....	1870	131,425
From 1883 to 1893 based on the U. S. Census of.....	1880	151,912
From 1893 to 1903 based on the U. S. Census of.....	1890	173,901
From 1903 to 1913 based on U. S. Census of..... ...	1900	194,182
From 1913 based on U. S. Census of.....	1910	212,407

DISTRICT COURT, a court having cognizance of cases arising within a certain defined district, more specifically as described below. In 1920 the United States was divided into 106 districts for judicial purposes, each State in the Union containing at least one district, and some of them more. For each district there are a judge, a district attorney, a marshal, and deputy marshals. They constitute the officers of the district courts. These tribunals have charge of the initial administration of justice in cases of offense against the Federal Government, and form a link in the judicial succession that culminates in the Supreme Court of the United States, being as it were the Federal courts of common pleas.

DISTRICT OF COLUMBIA, the Federal district of the United States, containing the National capital. Named for Columbus. Fixed as seat of United States Government in 1790 by an act of Congress. Formed out of Washington co., Md. (64 square miles), a portion of Virginian territory offered the Government being not now included. The United States Government removed to the District in 1800. The city of Washington was captured by the British in 1814, and the Capitol and Executive Mansion were burned. The District was governed by Congress till 1871, when a legislative body of 33 (11 appointed by the President and 22 elected) was created. This form of government was continued till 1878, when the government was invested in the present three commissioners, one of whom must be an army officer, and all of whom are appointed by the President and confirmed by the Senate. Congress makes all laws for the District. Citizens of the District have no vote for National officers. There is but one government for the entire District, with which the city of WASHINGTON (*q. v.*) is now coextensive.

DITCH, in agriculture, a trench usually made along the sides of fields, so that all the drains may be led into it, or along the top of a field to divert surface water. In arable lands, since the general use of small and large pipes, ditches have in many cases been converted into underground drains.

DITMARS, RAYMOND LEE, an American scientist, born in Newark, N. J., in 1876. He graduated from Barnard Military Academy in 1891. He was for 5 years assistant curator of entomology at the American Museum of Natural History and in 1899 became curator of reptiles at the New York Zoölogical Park. He was in charge of the department of mammals at this park from 1910. He was the author of "The Reptile Book" (1907); "Reptiles of the World" (1909). He also contributed numerous articles on entomology and kindred subjects to magazines.

DITTANY, the popular name of the plants of the genus *Dictamnus*, an herb of the rue family, found in the Mediterranean region. The leaves are pinnate, the large white or rose-colored flowers are in terminal racemes. The whole plant is covered with oily glands, and the secreted oil is so volatile that in hot weather the air round the plant becomes inflammable. *D. Fraxinella* and *D. albus* are found in gardens. The dittany of the United States is *Cunila Mariana*, a labiate plant. The dittany of Crete is *Origanum Dictamnus*, and the bastard dittany is a species of *Marrubium* (horehound), both labiates.

DIU (dē'ū), a seaport situated at the E. extremity of a Portuguese island (7 by 2 miles) of the same name, off the S. coast of Kathiawar; 180 miles N. W. of Bombay. Once an important city of 50,000 inhabitants, it has sunk in importance till now the whole island has but 15,000 inhabitants, mostly fishermen. Some magnificent buildings still attest its ancient splendor, such as the Jesuit College (1601), now a cathedral. The place has been in possession of the Por-

tuguese since 1535, and stood a famous siege in 1545.

DIURETICS, medicines which cause an increase of the function of the kidneys, and consequently augment the quantity of the urine. They are divided by Garrod into sedative, as squills, scoparium, tobacco, colchicum; and stimulant, as juniper, turpentine, copaiba, cantharides, nitrite of ethyl, alcohol, and water. Indirect diuretics, or hydragogue purgatives, as elaterium, cream of tartar, digitalis, gamboge. Lithontriptics, or remedies which alter the quality of the urine and prevent the crystallization and deposition of the ingredients which form gravel and calculi, as carbonates of lithium, potassium, sodium, and alkaline mineral waters, etc. Diuretics are given (1) to cause an increased flow of urine when the renal secretion is deficient; (2) to eliminate poisons and matters formed in disease from the blood; (3) to produce a larger flow of urine, to hold in solution substances which would be deposited, and form calculi.

DIURETIN, theobromine sodio-salicylate, $Na_2C_{14}H_{12}N_4O_5$. A whitish, amorphous powder, odorless, and possessing a sweet taste. Soluble in water and alcohol, insoluble in ether or chloroform. Used in medicine as a diuretic in cardiac dropsy and Bright's disease. Often administered in conjunction with digitalis, which prolongs its diuretic action.

DIVER, one of a family of birds, remarkable for their power and habit of diving. The neck is long, the tail is very short and rounded; the wings short; the bill straight, strong, and pointed. They are confined to N. latitudes, whence they migrate further S. in the winter season. The largest of the three European species is the great northern diver, but the other two—the red-throated diver, and the black-throated diver—are perhaps better known, as they are found in abundance in this country. They live on fish, which they follow under the water, propelling themselves along with their wings as well as their feet.

DIVES (rich), the name popularly adopted for the "rich man" in the parable of the rich man and Lazarus, from the Vulgate translation.

DIVIDEND, in arithmetic, a number which has to be divided by another; thus, if we have to divide 20 by 4, 20 is the dividend, and 4 the divisor. In bankruptcy, the fractional part of the assets of a bankrupt which is paid to the creditor in proportion to the amount of the debt which he has proved against the estate of the debtor. In commerce, the sum periodically payable as interest on loans, debentures, etc., or that periodically distributed as profit on the capital of a railway or other company.

DIVIDING ENGINE, a machine for marking the divisions on the scales of scientific, mathematical, or other instruments.

DIVIDING RANGE, GREAT, an Australian chain of mountains, forming the watershed between the rivers flowing into the Pacific and those running to the W. It is situated at an average distance of 30 miles from the sea, though in some places it recedes as much as 60 miles, and stretches from Cape York on the N. to Wilson's Promontory on the S. Culminating point, Mount Townshend (7,353 feet).

DIVIDIVI, the very astringent husks of *Cæsalpinia coriaria*, imported from South America, in the form of dark brown rolls containing a few flat seeds. The outer rind of the husks contains a large quantity of tannin, together with ready-formed gallic acid. Dividivi is used in tanning.

DIVINATION, the art or act of foretelling future events, or discovering things secret or obscure, by the aid of superior beings, or by other than human means; prescience; presage; prediction. At an early time divination formed a regular science, intimately allied with religion, and furnished with rules and regulations. Of all the nations of antiquity, few cultivated the science of divination with such enthusiasm as the Greeks and Romans. The different systems of divination employed by the ancients were of several kinds; by water, fire, air, earth; by the flight of birds, and their singing; by lots, dreams, arrows, etc. The Israelites were prohibited from practicing divination of any kind by the law of Moses.

DIVING APPARATUS, contrivances by means of which divers are enabled to remain a considerable time under water. As the most skilled divers are unable to remain under water more than two or three minutes without artificial respiration, means have been devised by hermetically sealed helmets, diving bells, and diving dresses, so that they can stay for several hours at a time at considerable depths of water and at the same time carry on their work. The diving bell was mentioned by the classic writers. Aristotle speaks of a diving bell or a reversed kettle or bell which was put over the head of the diver.

Sinclair in his work on gravitation (1669), mentions the diving-bell which was used in 1588, 1665, and 1687 to rescue the treasures of the Spanish Armada. The diving bell then used was similar to those used at the present time, though of much more clumsy con-



OUTFIT FOR DEEP-SEA DIVING

struction. Dr. Smeaton was the first to use an air pump for the supply of air, about 1788. He constructed a cast iron diving-bell which sank by its own weight and afforded room for two men.

Diving-dress, water-proof dress, or armor, was described as early as 1664. The diving-dress used at the present time may be independent of any connection with persons above. The most common one is a rubber cloth dress, with a copper helmet, having air-tight connections, and supplied by a reservoir, attached to the back and containing air, compressed to a number of atmospheres, which is supplied to the diver by means of a proper apparatus. Among the best known diving apparatus are those called by the name of Skaphander and those of Rouquairol-Denayrouze; in the United States, the Morse and the Schroder. By means of this apparatus the diver can remain from four to five hours under water with perfect freedom of motion. The diving apparatus most generally used in the United States is the rubber suit, copper helmet, with face plates of glass, and air pump. The diver is connected by rubber hose with the air pump which is constantly worked by an experienced man. Another man called the "tender" holds the air hose and a life line by which the diver signals his requirements. When the diver has to go into dark places, where the sunlight cannot reach, he is equipped with an incandescent electric light.

DIVINING ROD, a forked rod or branch, generally, but not necessarily, of hazel, by means of which it is pretended to the foolish and superstitious that the presence of water, minerals, etc., underground can be detected. When used, the rod, which is carried slowly along in suspension, will, as is affirmed, dip and point toward the ground when brought over the spot where the concealed water or mineral is to be found.

DIVISIBILITY, that general property of bodies by which their parts or component particles are capable of separation. Numerous examples of the division of matter, to a degree almost exceeding belief, may be easily instanced. Thus glass test-plates for microscopes have been ruled so fine as to have 225,000 spaces to the inch. Cotton yarn has been spun so fine that one pound of it extended upward of 1,000 miles, and a Manchester spinner is said to have attained such a marvelous fineness that one pound would extend 4,770 miles. One grain of gold has been beaten out to a surface of 52 square inches, and leaves have been made 367,500 of which would go to the inch of thickness. Iron has been reduced to wonderfully thin sheets. Fine tissue paper is about the 1,200th part of an inch in thickness, but sheets of iron have been rolled mu h thinner than this, and as fine as one 4,800th part of an inch

in thickness. Wires of platinum have been drawn out so fine as to be only the 30,000th part of an inch in diameter. Human hair varies in thickness from the 250th to the 600th part of an inch. The fiber of the coarsest wool is about the 500th part of an inch in diameter, and that of the finest only the 1,500th part. The silk line, as spun by the worm, is about the 5,000th part of an inch thick; but a spider's line is only the 30,000th part of an inch in diameter; insomuch that a single pound of this attenuated substance might be sufficient to encompass our globe. A single grain of the sulphate of copper, or blue vitriol, will communicate a fine azure tint to five gallons of water. In this case the sulphate must be attenuated at least 10,000,000 times. Odors are capable of a much wider diffusion. A single grain of musk has been known to perfume a large room for the space of 20 years.

DIVISION, in arithmetic, the dividing of a number or quantity into any parts assigned; one of the four fundamental rules, the object of which is to find how often one number is contained in another. The number to be divided is the dividend, the number which divides is the divisor, and the result of the division is the quotient. Division is the converse of multiplication.

DIVISION, in military matters, a portion of an army consisting of two or more brigades, composed of the various arms of the service, and commanded by a general officer. In the navy, a select number of ships in a fleet or squadron of men-of-war.

DIVISION, the mode of determining a question at the end of a debate in a legislative body. In the House of Representatives at Washington, a division has no traditional formalities, being determined by the rules of the body itself. In the Senate, a division is accomplished by a roll call. In the British House of Commons the Speaker puts the question, and declares whether in his opinion the "ayes" or the "noes" have it. Should his opinion not be acquiesced in by the minority, the house is cleared, and the "ayes" directed to go into the right lobby and the "noes" into the left, where they are counted by two tellers appointed for each party. In the House of Lords the two sides in a division are called "contents" and "not-contents."

DIVISION OF LABOR, in biology, a conception borrowed from economics and introduced into biology by Milne-Edwards, to describe the difference of function exhibited by the individual members of an animal colony, or by the different organs, tissues, and cells of a single organism. The figure of a hydroid colony, *Hydractinia*, shows how members, primarily and fundamentally the same in structure, become set apart as nutritive, reproductive, sensitive, and protective. The same division of labor or predominance of special functions in different individuals is beautifully illustrated in the *Siphonophora*.

DIVISION OF LABOR, in economics, a theory based on the principle that industry can be best carried on when each man has a special work to do. Constant practice in doing the same thing leads to a perfection which could not otherwise be attained.

DIVORCE, the disruption, by the act of law, of the conjugal tie made by a competent court on due cause shown. In the United States, jurisdiction in divorce cases is usually conferred on the law courts by the statutes in the different States, there being no ecclesiastical courts in the English sense of that term. The causes of divorce enumerated in these statutes are by no means uniform in relation to the various States, though more numerous in the Western States than in the Eastern. In most of the States divorce may be granted on either of the following grounds: Adultery, conviction of felony, cruel and inhuman treatment, wilful desertion for periods varying from one to three years, habitual drunkenness, impotency, or neglect to support the wife. In New York alone adultery is the only cause of absolute divorce; but in South Carolina the courts have no power to grant divorce, strictly speaking, the Legislature being the only authority for that purpose. In both of these States, as in others, the courts may declare an alleged marriage invalid on grounds which rendered the parties or either of them incapable of contracting it, such as idiocy, lunacy, former husband or wife living, etc. Separation from bed and board, commonly called limited divorce, is granted on the ground of cruel and inhuman treatment; or desertion and refusal to support by the huband may be a ground for a decree setting the wife free from the interference and control of her husband, though it may not sunder the marriage tie.

A person applying for a divorce will not be allowed to obtain judgment, should it appear that he or she has been guilty of the same offense, or that there is collusion between the persons concerned in order to procure a divorce; for the same reason the plaintiff is always required to prove the existence of the

grounds of divorce by satisfactory evidence, even though no contest is made on the other side. Parties also who have condoned the offense, *i, e.*, who, after it has been discovered, have consented again to live as husband and wife, are not allowed to obtain a divorce, but a second act of the same nature revives the right of action on the original offense.

The want of harmony in the legislation of the different States on this subject has led to very great confusion and conflict in regard to the rights and liabilities growing out of divorce against non-residents of the State where granted, and some uniform system of laws on the subject is greatly needed.

The Law of England.—The divorce court is composed of a judge ordinary, the three chiefs in the courts of common law, and three puisne judges. It is provided that either spouse may obtain a divorce on the ground of adultery, but in case the wife is petitioner the adultery must be accompanied by cruelty or desertion. By another act the power to pronounce a decree of divorce, which was at first reposed in the whole court, is given to the judge ordinary sitting alone; but in this case the decree so pronounced is a decree *nisi* and cannot become final for at least six months. After a decree of divorce the offending person is free to marry again, even with the paramour. But it is also enacted that no clergyman shall be compelled to solemnize the marriage of any person who has been divorced. He must, however, allow another clergyman, if willing to do so, to perform the marriage. The same general rules as to collusion, condonation, the conduct of the parties, etc., which obtain in the United States are law also in England. In order to guard against fraud by parties conniving to procure a divorce, power is given to the queen's proctor to interpose, in case he have reasonable grounds to suspect collusion or recrimination, in order to oppose a petition for divorce. By these acts parties are also entitled to obtain a judicial separation on the ground of adultery, cruelty or desertion. Judicial separation is declared to be in place of a separation "a mensa et thoro." A married woman, having obtained decree of judicial separation, is declared to be in all respects as a "feme sole" in regard to any property that she has or may acquire. Even before obtaining a separation a woman deserted by her husband may obtain from the court a protection for any property that she has or may acquire by her own industry.

Divorce in European Countries.—Since the year 1884 French law has recognized three grounds of divorce: (1) adultery; (2) outrage, cruelty, or grievous injury; (3) conviction of an infamous crime. These causes of action are equally available to husband or wife; but it is provided that the wife shall not marry again till after the expiration of 10 months from the date of the dissolution of the previous marriage. It is further provided that, in cases where divorce is sought on the ground of outrage, cruelty or grievous injury, immediate divorce shall not be granted, but the parties may be granted separation for a year, with due provision for the wife's support during that time, at the end of which a final divorce may be granted, if they have not been reunited in the meantime. Substantially the same rules as to condonation prevail as in the United States. All the proceedings necessary in such cases are carefully provided for by the code civil, as well as the consequences to the parties personal or proprietary. In Germany, the question of divorce gave rise to a long contest. The General Prussian Code permitted divorce on the ground of mutual consent and deep-seated aversion, but on account of the newly awakened religious life in the 19th century there was a strong opposition to this freedom of divorce; this under Friedrich Wilhelm IV. arose to an overwhelming power. Many attempts were made to establish the laws of divorce on a reasonable basis, but on account of the personal antagonism of Friedrich Wilhelm IV. they remained without result. The Austrian code of common law allows to non-Catholic Christians separation from the bonds of matrimony on account of adultery, malicious desertion, five years' imprisonment, or on account of dangerous diseases and repeated cruelty of treatment and invincible aversion.

DIX, DOROTHEA LYNDE, an American philanthropist; born in Worcester, Mass., in 1805. In her youth she supported herself by teaching, but in 1830 fell heir to some property, after which she devoted her life to the relief and betterment of lunatics, paupers, and criminals. She published several children's books, and, in 1845, "Prisons and Prison Discipline." She died in Trenton, N. J., July 19, 1887.

DIX, JOHN ADAMS, an American statesman and soldier; born in Boscawen, N. H., July 24, 1798. He was educated at Salisbury, Phillips Exeter Academy, the College of Montreal, and St. Mary's College. In 1812 he was appointed a cadet in the United States Army, and in 1813, ensign. He took part in the operations on the Canadian frontier during the War of 1812; afterward studied law and was admitted to the bar in Washington. In 1826 he was sent as a special

messenger to the court of Denmark. He resigned from the army in 1828, and began practicing law in Cooperstown, N. Y. Later he was Secretary of State and Adjutant-General of New York, and was prominently associated with the "Albany Regency," the controlling power of the Democratic party. In 1841 he was elected to the State Assembly, and in 1845-1849 was a United States Senator. In 1861 he was appointed Secretary of the Treasury by President Buchanan, and his appointment led to the breaking of a financial deadlock in the affairs of the government. When he became secretary there were two revenue cutters at New Orleans, and he ordered them to New York. The captain of one refused to obey his order, and Dix telegraphed to put him under arrest, adding the statement which has made him famous, "If any one attempts to haul down the American flag, shoot him on the spot." At the outbreak of the Civil War, he was elected president of the Union Defense Committee, and organized 17 regiments. He was commissioned a Major-General of volunteers, and through his active measures saved Maryland to the Union cause. He was elected governor of New York in 1872, but was defeated on a renomination in 1874. He died in New York City, April 21, 1879.

DIX, JOHN ALDEN, an American public official, born in Glens Falls, N. Y., in 1860. He graduated from Cornell University in 1883. He engaged in business and became identified with a number of important financial and industrial organizations. He was also active in politics and in 1908 was Democratic nominee for lieutenant-governor of New York. He was defeated, but was elected governor for the term 1910-1912.

DIX, MORGAN, an American clergyman; born in New York, Nov. 1, 1827, son of Gen. John A. Dix. He was graduated at Columbia in 1848 and at the General Theological Seminary in 1852, being ordained priest in the Protestant Episcopal Church in 1853. After 1862 he was rector of Trinity Parish, New York City. He published "The Seven Deadly Sins"; "Sermons"; "Gospel and Philosophy," etc. He died April 29, 1908.

DIXMUDE, a small town in the north of Belgium, about ten miles S. of Ostend and equally distant, in a northerly direction, from Ypres. It was the center of that little portion of the western edge of Belgium which the Belgian army was able to hold after the invasion of their country by the Germans, in the latter part of 1914, and was the center of a continuous struggle that lasted during the entire war. The Belgians were firmly intrenched here, and Dixmude was the center of the heaviest of the German artillery and infantry attacks. One of the biggest engagements fought on this sector was that which began on July 31, 1917, when the British and French forces launched their offensive against the Germans on a twenty-mile front, extending from Dixmude to Warneton, to the south, and which resulted in a notable victory, ten towns and 5,000 prisoners being captured during the first day.

DIXON, a city of Illinois, the county-seat of Lee co. It is on the Rock river, and on the Chicago and Northwestern and the Illinois Central railroads. Its industries include the manufacture of condensed milk, shoes, plows, wagons, wire, cloth, furniture, Portland cement, etc. It is the seat of the Northern Illinois Normal School and the Rock River Military Academy, and has a handsome court house and a public library. Pop. (1910) 7,216; (1920) 8,191.

DIXON, WILLIAM HEPWORTH, an English author; born in Manchester, June 30, 1821. In 1849 he published a memoir of Howard the philanthropist, which was followed by the "Life of William Penn" (1851), and by a work on Admiral Blake (1852). In 1853, after having been a contributor, he became chief editor of the "Athenæum," a post which he retained till 1869. During this period he published several very popular works, including the "Personal History of Lord Bacon," "The Holy Land," "New America," and "Spiritual Wives." After his retirement from the "Athenæum," he published about 25 volumes of history, travel, and fiction, among others, "Free Russia"; "Her Majesty's Tower"; "The Switzers"; "History of Two Queens, Catherine of Aragon and Anne Boleyn"; etc. He died in London, Dec. 27, 1879.

DIXON ENTRANCE, a strait on the W. coast of North America, separating Queen Charlotte Islands from the Prince of Wales Archipelago, and so dividing Britsh territory from a part of Alaska.

DIXY, HENRY, an American actor, born in Boston in 1859. In 1868 he became a member of the stock company of the Howard Athenæum of Boston. He afterward appeared in various companies. He made a great success in "Adonis," acting as a comedian in many plays in England and the United States.

DIZFUL (dēz-fōl'), a town in the Persian province of Khuzistan, about 190 miles W. of Ispahan, on the river Diz, here crossed by a handsome bridge of 20 arches. It has over 35 sacred tombs, and

nearly as many mosques; but half the town consists of subterranean excavations in the rock, on account of the heat.

DJEMAL PASHA, Minister of Marine in the Turkish Government at the time Turkey definitely decided to throw in her lot with the Central Powers, after the outbreak of the World War, in the fall of 1914. Djemal Pasha, though strongly pro-German, as were most of the leaders of the Young Turk party, then in power, was nevertheless supposed to be the restraining influence which caused the Turkish Government to hesitate for some months after the outbreak of hostilities. After the arrival of the German cruisers, the "Goeben" and the "Breslau," in Constantinople, with several hundred technical experts and marines to strengthen the Turkish Navy, he was finally won over and joined his colleagues against the Allied Powers.

DNIEPER (nē'per), a river of Russia which rises in the government of Smolensk, flows first S. W., then S. E., and latterly again S. W. to the Black Sea. It begins to be navigable a little above Smolensk, and has a total length, including windings, of 1,230 miles. Among its tributaries are the Beresina, the Pripet, the Desna, and the Psiol. In its lower course there are important fisheries

DNIESTER (nēs'ter), a river of Europe, which has its source in the Carpathian Mountains, in Galicia, enters Bessarabia at Chotin, and empties itself into the Black Sea, after a course of about 750 miles. Its navigation is difficult on account of frequent shallows and rapids.

DOANE, WILLIAM CROSWELL, an American Protestant Episcopal Bishop, son of George Washington Doane; born in Boston, Mass., March 2, 1832. He was ordained to the Protestant Episcopal priesthood in 1856. Having served from 1863 to 1867 as rector of St. John's Church, Hartford Conn., he was made Bishop of Albany in 1869. Chancellor of the Regents of University of New York (1902). Publications: "Life of Bishop G. W. Doane," "Mosaics; or the Harmony of Collects, Epistles and Gospels" (1881); "Rhymes of the Times" (1901), etc. He died May 17, 1913.

DOBELL, SYDNEY THOMPSON, an English poet; born in Cranbrook, in Kent, April 5, 1824. A passionate interest in Italian freedom inspired his dramatic poem "The Roman," (1850). His services to the cause of free institutions were heartily acknowledged by Kossuth and Mazzini. A later poem, "Balder," had less vogue. In 1856 he published a volume of dramatic and descriptive verses relating mostly to the Crimean War, "England in Time of War." After his death a volume of essays was published "Thoughts on Art, Philosophy, and Religion." He died in the Cotswold Hills, Aug. 22, 1874.

DOBEREINER'S LAMP, a contrivance for producing an instantaneous light, invented by Professor Dobereiner, of Jena, in 1824. The light is produced by throwing a jet of hydrogen gas upon recently-prepared spongy platinum, when the metal instantly becomes red hot, and then sets fire to the gas.

DOBRUDJA, THE (dō-brōd'shä), a territory forming part of the kingdom of Rumania, included between the Danube, which forms its boundary on the W. and N., the Black Sea on the E., and on the S. by a line stretching from Silistria to a point a few miles S. of Mangalia. There are some fertile spots, but on the whole it is marshy and unhealthy. The population is of various nationalities, Rumanians, Bulgars, Greeks, Turks, and Jews. The inhabitants support themselves by rearing sheep and buffaloes. The principal town is Babadagh. Pop. about 400,000. The territory was the scene of repeated fighting during the World War, and was invaded in turn by Rumanian, Austrian, and German armies. (See WORLD WAR.) It was awarded to Rumania by the Peace Conference in 1919.

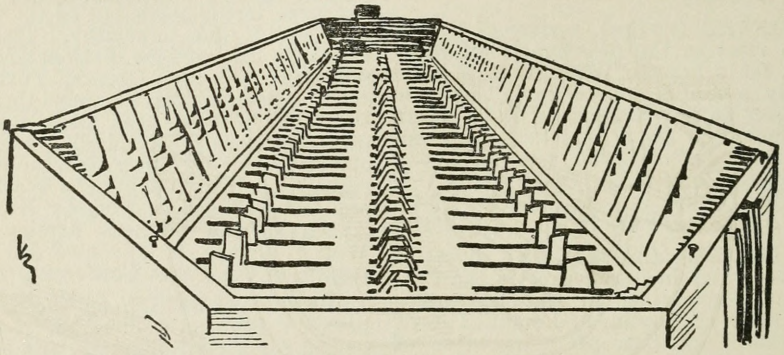
DOBSON, AUSTIN, an English poet; born in Plymouth, Jan. 18, 1840. Intended for a civil engineer, and educated abroad, he accepted a place under the Board of Trade. His poems are inimitable in their artistic finish and grace of fancy. They are contained in the volumes: "Vignettes in Rhyme and Vers de Société" (1873); "Proverbs in Porcelain" (1877); "Old-World Idyls" (1883); "Eighteenth Century Vignettes" (1892); "Old Kensington Palace" (1910); "Rosalba's Journal" (1915); "Prior Park" (1917). He has written biographies of Hogarth, Fielding, Steele, Goldsmith, and other literary notables, and contributed many articles to the English "Dictionary of National Biography."

DOCETÆ (dō-sē'tī), a name applied to those heretics in the early ages of the Church who maintained that Christ, during His life on earth, had not a real or natural, but only an apparent or phantom-like body. The bolder docetæ assumed the position that Christ was born without any participation of matter; they denied accordingly the resurrection and the ascent into heaven. The milder school of docetæ attributed to Christ an ethereal and heavenly, instead of a truly human body.

DOCK, a name applied to different plants of the genus *Rumex*, belonging to the rhubarb family. These are large herbaceous plants, with stout roots, and bearing panicles of small greenish flowers. The roots of some of them are used medicinally as astringents.

DOCK, an inclosure for the accommodation of shipping. Docks may be divided into two principal classes, viz., wet docks and dry docks (or graving docks).

Wet docks are used almost exclusively for purposes of marine commerce. Where the range of tide is more than 10 to 12 feet, docked vessels are kept alongside of the quay or dock at as nearly a uniform elevation as practicable by means of inclosing requisite water areas and preventing by suitable means the outflow of water during ebb tides. Such docks are frequently approached through what is called a tidal basin, or sometimes a half-tide basin, the latter expression indicating the fact that ships may freely enter or leave such basins during the upper half of the tidal range.



CONCRETE DRY DOCK

In order that ships may enter or leave wet docks at any stage of tide, it is necessary that the entrances be fitted with locks. A lock in a wet dock is a long narrow chamber with its sides constructed of masonry or timber, with what are called gates at each end. Each of these gates usually consists of two parts or leaves, each precisely like the other. These leaves or half gates swing about vertical axes, and then close against each other, forming an obtuse angle like the two sides of a short and broad letter "A," pointing inward to the dock where the highest water is to be found. Such gates are called miter gates; the pressure of water against them tends to hold them shut till the height of water is equalized on both sides. Sluices fitted with proper valves are made, either in the lock gates, in the side walls of the lock chamber, or under the floor of the latter, through which water may flow from the dock into the lock chamber till the elevation of water in the latter is the same as that in the dock. When the lock is filled with water the gates between it and the dock are opened. After the ships have been admitted the gates are closed and the water is allowed to flow from the lock through sluices like those already described leading into the lower water of the basin or outer harbor. When the lock water in which the ship is floating has fallen nearly to the level of the water of the tidal basin or harbor, the gates at the exit end of the lock are opened, enabling the ship or ships to pass freely outward. The simple reversal of the latter operation enables a ship to enter the wet dock at any stage of the tide. The comparatively small range of the tides on the coast of the United States makes it unnecessary to construct closed docks in American ports; hence American docks, which correspond to the wet docks in Great Britain or other foreign countries, are simply open oblong spaces of water between substantially constructed timber or masonry piers.

Tidal-basin or half-tide docks are inclosures between wet docks and the open harbor. The gates or lock through which vessels enter or leave them are kept open during the upper half of the tidal range, so that ships may freely enter or leave during that period of time. The gates are closed, however, when the tide has half ebbed; from that time to the next mid-tide ships must enter and leave the tidal basin, if at all, in precisely the same manner as that of entering or leaving the wet dock. The tidal basins are useful for the purpose of receiving ships prior to entering the wet dock, or on coming from the latter, having received their cargo.

Tidal docks are basins surrounded by quay walls, and having open entrances permitting the free flow and ebb of the tide; they have the advantage of requiring no opening or shutting of gates. With small tides they answer very well; they are sometimes made deep enough to keep vessels afloat at low water. They are much more liable to silt up than wet docks.

Dry docks are inclosures with one end movable. Like wet docks, they are built of both masonry and timber, the former material being the more substantial.

Dry docks of the floating type are built of both steel and timber, the former material being better adapted to structures of large capacity and now generally used.

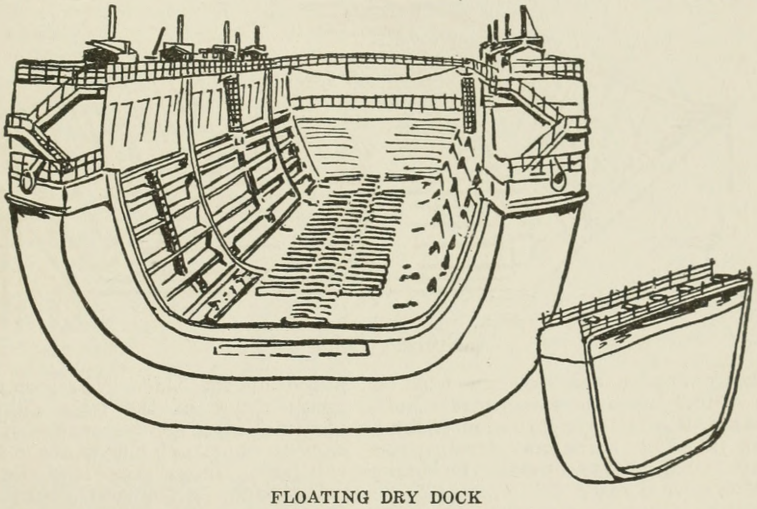
The ordinary dry dock, whether built of timber or of masonry, is preferably located where a foundation of very firm material is available. The top surface is a few feet only above high water; the bottom is placed at such depths as will accommodate the ships of greatest draught which are to use them. The movable end of the dock, if small, may be formed of a pair of gates like those of wet docks; but for structures of the dimensions requisite to accommodate large ships it is usually formed by a caisson, *i. e.*, a floating vessel usually of steel, and deep enough to close the opening to the dock, and wide and stiff enough to sustain the water pressure at its full height on the outside, with no water on the other or dock side.

The interior of the dry dock consists of a floor constructed with sufficiently strong foundations to sustain the weight of the heaviest ship which is to enter it. At one end of this floor is placed a sill, against which and the corresponding surfaces on the two vertical sides of the entrance the caisson rests in order to make the closed chamber. The sides and one end of the dry dock are formed of substantially built steps called altars, the approximate outline of which is more or less nearly parallel to the sides of the ships as they lie in the dock.

Floating dry docks are composed of one or more large pontoons, so constructed and arranged as to carry along each side pumps and other appliances on suitable stiff frames. When the pontoons are filled with water they sink, and when water is pumped out of them they rise to a height corresponding to the amount of water taken out.

In 1919 considerable progress was made in the construction of dry docks of the navy and merchant marine. In Norfolk, a navy yard dry dock measuring 1,011 feet long, 144 feet wide, and 40 feet deep, built at a cost of $4,500,000, was opened April, 1919. There was at the same time under construction in Boston a dry dock, 1,106 feet long and 149 feet wide. This dock was purchased by the Government and was used to provide accommodations for the largest naval and commercial ships. A dock of practically the same size as the Norfolk dock was constructed at the Philadelphia Navy Yard, and in 1920 the construction of a similar dock at the Charleston Navy Yard was begun. A dock of over 1,000 feet long and 150 feet wide was also constructed in San Francisco.

In August, 1919, the great dry dock at



FLOATING DRY DOCK

Pearl Harbor, in the Hawaiian Islands, was completed and flooded. This dock is 1,022 feet long, 138 feet wide, and 39½ feet in depth.

DOCKET, or **DOCQUET**, in law, a term variously used, as for a summary of a larger writing; a small piece of paper or parchment containing the heads of a writing; an alphabetical list of cases in a court, or a catalogue of the names of the parties who have suits depending in a court.

DOCK WARRANTS, orders for goods kept in the warehouses connected with a dock. They are granted by the proper officer at the dock to the importer in favor of any one that he may name. These warrants are held to be negotiable, so that they may pass from one holder to another, the property of them being always vested in the holder.

DOCK YARD. See NAVY YARDS.

DOCTOR, properly, a teacher or instructor; one so skilled in some particular art or science as to be able to communicate to others. It is generally believed to have been first adopted as a distinctive title in the 12th century, and to have originated with the University of Bologna. The University of Paris followed immediately after, and, in 1145, conferred the degree of doctor of divinity on Peter Lombard. In England the degree of doctor was not introduced in the universities till the reign of John, or Henry III. In modern times, the title of doctor forms generally the highest degree in the faculties of theology, law, and medicine. In Germany, the title of doctor in philosophy has been substituted for the older title of master, which is still retained in England. In the European universities, before receiving the degree of doctor, a student has to prepare one or more theses. In this country the title is conferred upon those of eminent learning or ability in their profession, without demanding from them any trial; excepting in the medical profession, where it is bestowed at the end of a course of study.

In scripture, a doctor of the law may perhaps be distinguished from scribe, as rather teaching orally than giving written opinions (Luke ii : 46). Doctors of the law were mostly of the sect of the Pharisees, but are distinguished from that sect in Luke v : 17, where it appears that the novelty of Jesus' teaching drew together a great company both of Pharisees and doctors of the law. The Jewish were invested with the dignity of doctor, by receiving into their hands a key and a tablet-book.

Doctor of music. In England, a musician upon whom the degree of doctor has been conferred by some university. The candidates are required to submit for the inspection of the musical profession a composition in eight vocal parts, with instrumental accompaniments.

DODDER, the common name for plants of the genus *Cuscuta*. There are several species; they are slender, thread-like, twining, leafless parasites, involving and destroying the whole plants on which they grow. Two species are natives of England: *C. epithymum*, which grows abundantly on ericas, and *C. europæa*, upon thistles and nettles or other soft plants within its reach, bringing them to final destruction. Within a few decades two other species have accidentally been introduced: viz., flax dodder and clover dodder. The first destroys whole fields of flax, and the latter preys to a great extent on clover, both plants being the cause of great losses to the agriculturist. In India, some species are very large and powerful, involving trees of considerable size in their grasp.

DODDRIDGE, PHILIP, an English Nonconformist clergyman and author; born in London, June 26, 1702. The Duchess of Bedford offered him an education at either university and provision in the Church; but he determined to enter the Nonconformist ministry. He was educated at a theological academy at Kibworth, in Leicestershire. In 1723 Doddridge became pastor of the dissenting congregation at Kibworth. He settled in 1729 at Northampton as minister and president of a theological academy. Here he continued to preach and train young students for the ministry till shortly before his death, which occurred Oct. 26, 1751, in Lisbon.

Doddridge was at once liberal and evangelical. His principal work is "The Rise and Progress of Religion in the Soul" (1745), which has been translated into Dutch, German, Danish, French, and even Syriac and Tamil. Besides this, may be mentioned "The Family Expositor" (6 vols. 1739-1756). His hymns have carried his name over the English-speaking religious world, perhaps the best known being "Hark, the glad sound, the Saviour comes," and "O God of Bethel, by whose hand." His works fill 10 volumes (Leeds, 1802-1805). His "Correspondence and Diary" was edited by his great-grandson (5 vols. 1829-1831).

DODGE, GRENVILLE MELLEN, an American military officer; born in Danvers, Mass., April 12, 1831; educated at Partridge's Military Academy and Norwich University: and was employed as an

engineer in the construction of the Illinois Central and Rock Island railroads. He entered the Civil War as colonel of the 4th Iowa Infantry; commanded a brigade at Pea Ridge in March, 1862, and became a Major-General of United States volunteers in June, 1864. He commanded a corps of General Sherman's army in the campaign against Atlanta (1864), and succeeded Rosecrans as commander of the Department of Missouri in December of that year. After the war he was chief engineer of the Union Pacific railroad and superintended its construction, and was a member of Congress from Iowa in 1867-1869. He succeeded General Sherman as president of the Association of the Army of the Tennessee in 1894, and was also president of the New York Commandery of the Loyal Legion. In 1898 he was made chairman of the President's Commission to inquire into the management of the War Department in the war with Spain. He died Jan. 3, 1916.

DODGE, MARY ABIGAIL, an American journalist and author; born in Hamilton, Mass., in 1838. For several years she was instructor in the High School at Hartford, Conn. From 1865 to 1867 she was one of the editors of "Our Young Folks." Besides numerous contributions to current literature, she has written, under the pseudonym of "Gail Hamilton": "Gala Days" (1863); "Woman's Wrongs" (1868); "The Battle of the Books" (1870); "Woman's Worth and Worthlessness" (1871); "The Insuppressible Book" (1885); "Red-Letter Days"; "Country Living and Country Thinking"; "Twelve Miles from a Lemon"; and "Biography of James G. Blaine." She died in Hamilton, Mass., Aug. 17, 1896.

DODGE, MARY ELIZABETH MAPES, an American editor, author, and poet; born in New York City in 1838. Since 1873 she has been the editor of "St. Nicholas" (magazine), New York. Her best-known work is "Hans Brinker, or the Silver Skates" (1876), which has been translated into five foreign languages. Among her other works, are: "Irvington Stories" (1864); "Theophilus, and Others" (1876); "Along the Way" (1879); "Donald and Dorothy" (1883); "The Land of Pluck." She died Aug. 22, 1905.

DODGE, THEODORE AYRAULT, an American military officer and writer; born in Pittsfield, Mass., May 28, 1842; received his military education abroad. Returning to the United States, he enlisted (1861) in the Union service as a private, attaining the rank of colonel, Dec. 2, 1865. He published; "The Campaign of Chancellorsville" (1881); a "Bird's-Eye View of the Civil War" (1883); "A Chat in the Saddle" (1885); and a series of studies called "Great Captains," comprising volumes on Alexander the Great, Hannibal, Gustavus Adolphus, etc. He died Oct. 26, 1909.

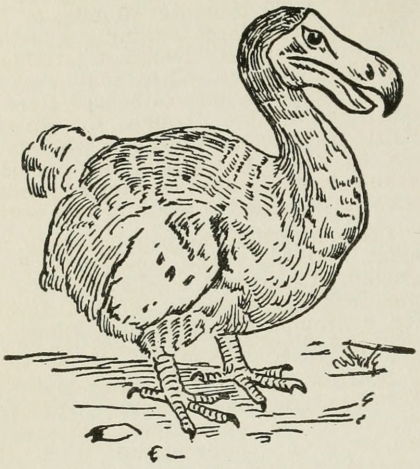
DODGE, WILLIAM EARL, an American capitalist; born in Hartford, Conn., Sept. 4, 1805. He received a common school education, entered the wholesale dry-goods business, and in 1833 became a member of the firm of Phelps, Dodge & Co., retiring in 1879 with a large fortune. He was director of the Erie railroad, president of the New York Chamber of Commerce, trustee of Union Theological Seminary, a founder of the Union League of New York, and an ardent friend of the freedman. He died in New York City, Feb. 9, 1883.

DODGE CITY, a city of Kansas, the county-seat of Ford co. It is on the Arkansas river, and on the Atchison, Topeka and Santa Fé and the Chicago, Rock Island and Pacific railroads. It is the center of an important stock-raising and wheat-growing district. In the seventies it was the chief shipping point for cattle. The division offices and machine shops of the Santa Fe railroad are located here. It is the seat of St. Mary's of the Plains Academy, and has a public library and a United States Land Office and Weather Bureau building. Pop. (1910) 3,214; (1920) 5,061.

DODGSON, CHARLES LUTWIDGE, an English humorist (better known by his pen-name of Lewis Carroll); was born in 1832. He entered Christ Church, Oxford, graduated in 1854. He was elected a student of his college, took orders in 1861, and from 1855 to 1881 was mathematical lecturer. Under the name of Lewis Carroll he issued in 1865 "Alice's Adventures in Wonderland," which, with its continuation "Through the Looking-Glass" (1872), has become a nursery classic. He also published some poems and parodies entitled "Phantasmagoria" (1869); "Hunting of the Snark" (1876); "Doublets" (1879); "Rhyme? and Reason?" (1883); "Euclid and His Modern Rivals" (1879); "A "Tangled Tale" (1886); "Game of Logic" (1887); and "Mathematica Curiosa" (1888), the last a valuable contribution to mathematics. He died Jan. 14, 1898.

DODO, a large bird, belonging to the order *Columbidæ*, or pigeons, that inhabited Mauritius in great numbers when that island was colonized in 1644 by the Dutch, but which was totally exterminated within 50 years from that date. The dodo was a heavy bird, bigger than

a turkey, and incapable of flight. The wings were rudimentary, the legs short and stout, and the tail a tuft of soft plumes. The beak was strongly arched



DODO

toward the end, and the upper mandible had a hooked point like that of a bird of prey.

DODONA (dō-dō'nä), a town of Thesprotia in Epirus (or Thessaly), in the midst of vast forests. It was the sanctuary of the Pelagic worship, and possessed an oracle of Jupiter, one of the most celebrated and most ancient of Greece. The oracles were given by an oak, called the prophetic tree; the priestess interpreted sometimes the rustling of the branches, sometimes the sound given out by copper vases suspended to the sacred tree; and, at others, the singing of doves hidden in its foliage or the murmur of a neighboring spring.

DODSLEY, ROBERT, an English poet and dramatist; born at Mansfield, Notts., in 1703. He was a noted bookseller and publisher in London, and had close relations with the authors of the time: Pope, Johnson, Goldsmith, Burke, etc. His first volume of verses, "The Muse in Livery," was received with great favor, as was his satiric drama, "The Toy Shop," brought out at Covent Garden. He wrote the popular comedies: "The King and the Miller of Mansfield"; "Sir John Cockle at Court"; and the tragedy "Cleone." He died in Durham, Dec. 25, 1764.

DOE, JOHN, and **RICHARD ROE**, two fictitious personages of the English law who formerly appeared in a suit of ejectment. This fictitious form of procedure was abolished in 1852. In the United States John Doe and Jane Doe are used in many parts of legal proceedings where the real names of offenders cannot be ascertained, or where there are reasons for concealing them.

DOG, a digitigrade, carnivorous animal, forming the type of the genus *Canis*, which includes also the wolf, the jackal, and, as a sub-genus, the fox. The origin of the dog is a much debated question, some considering the breed derived from the wolf, an opinion which is based on resemblances of structure, the fact of the two animals breeding together and producing fertile young, and the equality in the period of gestation. It is generally agreed that no trace of the dog is to be found in a primitive state, the dhole of India, and dingo of Australia being believed to be wild descendants from domesticated ancestors. Several attempts to make a systematic classification of the varieties of dogs have been made, but without much success. Hamilton Smith divides dogs into six groups, as follows: (1) Wolf-dogs, including the Newfoundland, Eskimo, St. Bernard, shepherd's dog, etc.; (2) Watch-dogs and cattle-dogs, including the German boarhound, the Danish dog, the matin dog, etc.; (3) Greyhounds, the lurcher, Irish hound, etc.; (4) Hounds, the bloodhound, staghound, foxhound, setter, pointer, spaniel, cocker, poodle, etc.: (5) Cur-dogs, including the terrier and its allies; (6) Mastiffs, including the different kinds of mastiffs, bull-dog, pug-dog, etc. Dogs have in the upper jaw six incisors, two strong, curved canines, and six molars on each side, the first three, which are small and have cutting edges, being called false molars; in the lower jaw are six incisors, two canines, and on each side seven molars. The female has six to ten mammæ; she goes with young nine weeks as a rule. The young are born blind, their eyes opening in 10 to 12 days; their growth ceases at two years of age. The dog commonly lives about 10 or 12 years. By English law it is prohibited to use dogs for purposes of draught.

DOGBANE, an American plant found from Canada to the Carolinas, belonging to the natural order of *Apocynaceæ*. The whole plant is milky; the root is intensely bitter and nauseous, and is employed in the United States instead of ipecacuanha. Another species yields a useful fiber, and is known as Canada or Indian hemp.

DOG DAYS, the name applied by the ancients to a period of about 40 days, the hottest season of the year, at the time of the heliacal rising of Sirius, the dog-star. The time of the rising is now, owing to the precession of the equinoxes, different

from what it was to the ancients, July 1; and the dog days are now counted from July 3 to August 11, that is, 20 days before and 20 days after the heliacal rising.

DOGE (dōj), the title borne by the chief magistrate in the former Italian republics of Venice and Genoa. The dogate, or office and dignity of doge, was elective; the doge of Genoa being elected for two years, and at Venice for life. The office was originated in the latter city in the year 697. When the seven tribunes, by whom state affairs had been previously administered, were found unequal to their posts, the Venetians resolved to replace them by a single chief magistrate, who should hold office for life. The doge was chief of the council, first minister, and personal representative of the republic; but, though invested with almost regal authority, he was not a sovereign. He could convoke assemblies, declare war, or conclude treaties, command the armies of the state, appoint the military tribunes and the judges, correct citizens, hear appeals, decide disputes between the clergy, award ecclesiastical punishments, invest bishops, and install them in their churches.

Notwithstanding these vast powers, a perusal of the history of Venice will prove, that though the Venetians allowed four centuries to elapse before they fixed the bounds or controlled the exercise of the power of their chief magistrate—after that time the doge was merely the representative of an authority which was actually reserved to the republic. In fact he was a state pageant who lent the weight of his name to the acts of the senate. Dispatches were directed to him by ambassadors, but he could not open them, except in presence of the councillors; and although money was struck in his name it did not bear his stamp or arms. He could not go beyond Venice without permission of the council. He could not divest himself of his dignity at will; and at his death three inquisitors and five correctors examined into his conduct with the most searching rigor. The office, after an existence of 1,100 years, yielded, with but slight resistance, to the power of the republic of France.

DOGFISH, the name given to any species of the genus *Scylium*, the type of the family *Scylliidæ*. Dogfish are like small sharks. They are, moreover, oviparous. Of the known species, which are about 11, the small-spotted dogfish, the large-spotted dogfish, and the black-mouthed dogfish are the best known. The egg cases are curious bodies, like purses. They are popularly known as mermaid's purses, sea purses, etc.

DOGGER BANK, an extensive sand bank of the German Ocean, celebrated for its codfishery. It begins about 36 miles E. of Flamborough Head and extends E. N. E. to within 60 miles of Jutland, in some places attaining a breadth of about 60 miles, though it terminates merely in a point. Where shallowest the water over it is nine fathoms. Here on the night of Oct. 21 1904, the Russian Baltic fleet under Admiral Rozhdestvenski, en route for Japan, mistook Hull fishing boats for hostile ships and sank a trawler, causing the death of two men.

DOG LICHEN, the popular name of a plant, *Peltidea canina*, common on damp ground, stones, and trunks of trees. It was formerly supposed to be a specific for hydrophobia. It is also known as ash-colored ground liverwort.

DOGMA, in the Septuagint and New Testament, signified a decree or precept; by classical Greek writers it is used in the sense of a philosophical tenet. Its general meaning is a principle or maxim laid down in the form of a positive assertion, and hence "the Dogmatic Method" is the method pursued in such a science as mathematics, which starts from axioms and postulates, and deduces everything from these by means of proofs. But where the fundamental principles are either unknown or much contested, the dogmatist is one who assumes certain principles without proof as the foundation of his system. The word dogma is especially used to signify the whole (or any one) of the doctrinal forms in which the religious experience of the Christian Church has from time to time authoritatively expressed itself, as distinguished from the opinions held by Church-teachers individually.

DOGMATIC, in ecclesiastical history, one belonging to one of the three orders of theologians before the Reformation. These orders were thus classed: (1) The Dogmatics, so called because they based their systems or dogmas on the authority of Scripture, and the judgment of the fathers. (2) The Mystics, who, in disparagement of Scripture, framed their opinions according to the dictates of spiritual intuition. (3) the Scholastics, who paid an almost sacred deference to the Aristotelian philosophy.

The word was also applied to one of a sect of physicians founded by Hippocrates who based their rules of practice on general principles or conclusions deduced from theoretical influences. They were opposed to the Empirics and Methodists.

DOGMATICS, a systematic arrangement of the articles of Christian faith

(dogmas), or the branch of theology that deals with them. The first attempt to furnish a complete and coherent system of Christian dogmas was made by Origen in the 3d century.

DOG ROSE, a common plant in hedges and thickets; also called the wild brier. The fruit is known as the hep or hip. The ripe fruit is used to prepare confection or conserve of hips, which is used in the preparation of certain kinds of pills.

DOG-STAR, a name for Sirius, the star that gives its name to the dog days.

DOG'S-TAIL GRASS, a small genus of meadow grasses, of which the crested species is esteemed alike for pastures and lawns.

DOGTOOTH, in architecture, an ornament or molding used from late Norman to early decorated, in the form of a four-leaved flower, with the center projecting.

DOG-TOOTH VIOLET, a liliaceous plant which owes its name partly to the color of its flowers, partly to the tooth-like bulb, a frequent inmate of the rock garden or herbaceous border, presenting a characteristic appearance, not only in March and April, from its large, abundant flowers, but on account of its peculiarly blotched leaves. In Tartary its bulbs yield starch, and in Russia they are used medicinally.

DOGWATCH, on shipboard, a name given to each of two watches of two hours each instead of four, adopted for the purpose of varying the hours of watches kept by each part of the crew during the 24 hours, otherwise the same watch would invariably fall to the same men. In order to obviate this the watches are arranged thus: 8 to 12 P. M. (*a*); 12 to 4 A. M. (*b*); 4 to 8 A. M. (*a*); 8 to 12 A. M. (*b*); 12 to 4 P. M. (*a*); 4 to 6 P. M. (*b*), dogwatch; 6 to 8 P. M. (*a*), dogwatch; 8 to 12 P. M. (*b*) and so on.

DOGWOOD, a common name for plants of the genus *Cornus*, but more especially applied to *C. sanguinea*. The wood is hard, and is sometimes used for butchers' skewers, toothpicks, etc. The fruit is black, about the size of a currant, very bitter, and yields an oil used in France for burning in lamps and for soapmaking. The following are the best known varieties:

1. *Cornus florida* is a common American shrub, growing 6-10 feet in height, and bearing beautiful white clusters of flowers, enlivening the hedges and bush of the warmer portion of the United States. It is productive of a bark much valued as an antiperiodic in ague, etc., and its wood, which is hard, white, and close grained, is useful in various ways. One unique use of its small branches is to form tooth-brushes with which women in some of the Southern States "dip" snuff.

2. *Euonymus europæus*. Loudon says, "It is called dogwood because a decoction of its leaves was used to wash dogs to free them from vermin"; and this derivation receives some support from another of its synonyms, louse-berry tree.

DOHRN, ANTON (dōrn), a German zoölogist; born in Stettin, Dec. 29, 1849; studied at Königsberg, Bonn, Jena, and Berlin, lectured for a time on zoölogy at Jena, and in 1870 founded the great zoölogical station at Naples. As an embryologist he devoted himself mainly to the development of insects and crustaceans; and besides reports, published works on the origin of the vertebrates. He died Sept. 29, 1909.

DOIT, a small copper coin current in Scotland during the reigns of the Stuarts. It was a Dutch coin, in value equal to the eighth of an English penny, or half a farthing.

DOLABELLA, PUBLIUS CORNELIUS (dol-ä-bel'lä), the son-in-law of Cicero, who took sides with Julius Cæsar in the civil war, served under him at Pharsalia, Thapsus, and Munda, and was made by him consul and governor of Syria. He was deprived of his government by Cassius, and revenged himself by putting to death Trebonius, governor of Asia Minor, and one of the assassins of the dictator. Declared an enemy of the republic for this act, he took refuge in Laodicea, where he was besieged by Cassius and compelled to commit suicide, 43 B. C.

DOLBEAR, AMOS EMERSON, an American physicist and inventor; born in Norwich, Conn., Nov. 10, 1837; was a valuable contributor to science. Among his publications are: "The Art of Projecting" (1876); "The Speaking Telephone" (1877); "Sound and Its Phenomena," and "Matter, Ether, and Motion." He patented the magneto-electric telephone and the static telephone in 1879. He died in 1910.

DOLCI, CARLO or **CARLINO** (dol' chē), a painter of the Florentine school; born in Florence in 1616. He received his first instruction in art from Jacopo Vignali, a pupil of Roselli. His works consist chiefly of madonnas and saints. The faces are full of a pleasing and tender softness, which, however, is often carried so far as to rob them of all character. His works are numerous and

scattered over all Europe. Besides his madonnas the most famous are his "St. Cecilia," "Christ Blessing the Bread and Wine," and "Herodias with the Head of John the Baptist," in Dresden. He died Jan. 17, 1686.

DOLCINITES (from Dolcino, their founder), a Christian sect which arose in Piedmont in 1304, under the leadership of Dolcino, who was opposed to the papacy, and otherwise held tenets like those of the spiritual Franciscans and the Paterines of Lombardy. At the instance of the Inquisition troops were sent against them in 1307. After making a brave resistance Dolcino and a number of his followers were captured. They were first tortured and then burned alive.

DOLDRUMS, among seamen, the parts of the ocean near the equator that abound in calms, squalls, and light baffling winds; otherwise known as the horse-latitudes.

DÔLE, a town in the French department of Jura, on the Doubs, 29 miles S. E. of Dijon by rail. It contains a Gothic cathedral, a college, and a library; and it has quarries, foundries, manufactures of metal wares, and a trade in wine and cheese. Pop. about 16,000. Dôle, the birthplace of Pasteur, is the Dola Sequanorum of the Romans, of whom many traces remain. It was in the 15th, 16th, and 17th centuries a strong and oft-disputed fortress, and the capital of the Franche-Comté with a university and a parliament

DOLE, CHARLES FLETCHER, an American clergyman and writer, born in Brewer, Me., in 1845. He graduated from Harvard University in 1868 and from the Andover Theological Seminary in 1872. He served as minister in Portland and in Jamaica Plain, Mass., from 1879 to 1916. Among his writings are "The Citizen and the Neighbor" (1884); "The Golden Rule in Business" (1895); "The Theology of Civilization" (1899); "The Spirit of Democracy" (1906); "The Ethics of Progress" (1909); "The Burden of Poverty" (1912).

DOLE, NATHAN HASKELL, an American literarian; born in Chelsea, Mass., Aug. 31, 1852. He was graduated from Harvard University in 1874, and after several years of teaching, engaged in literary work in Boston and New York. He was literary and musical editor of the Philadelphia "Press" until 1887, when he became literary adviser to the firm of T. Y. Crowell & Co. His principal original works are: "Young Folks' History of Russia" (1881); "A Score of Famous Composers"; "The Hawthorn Tree" (1895); "The Mistakes We Make" (1898), and "Omar, the Tent-Maker" (1898). In 1899 he edited the complete works of Count L. N. Tolstoi, whose novels, "Anna Karenina," "War and Peace," and many others he had already translated. He has also translated "Maria y Maria," "Maximina," and "Sister St. Sulpice," from the Spanish of Valdes; "The Letters of Victor Hugo," novels from the French; and a multitude of songs for music, operas, etc. In 1896 he edited a multivariorum edition of the "Rubaiyat of Omar Khayyam," containing many translations in English, French, German, Italian, Hungarian, and Danish. Among his more recent works are "Life of Tolstoi" (1911), "Spell of Switzerland" (1913). He has lectured widely before women's clubs and other institutions. In 1882 he married Helen James Bennett, well known for translations from the French and German.

DOLE, SANFORD BALLARD, an American statesman; born in Honolulu, Hawaii, April 23, 1844, his parents being missionaries on the island. Dole received his early education in Oahu College, Honolulu, and completed his studies at Williams College, Williamstown, Mass. He studied law in Boston and was admitted to the bar in 1873, returning in the same year to Hawaii. In 1884 he was made a member of the Legislature and again in 1889. He had been in the meantime, in 1887, appointed an Associate Judge of the Supreme Court, under the monarchy, which post he resigned to accept the leadership of the revolution that overturned the monarchy in January, 1893, and established a provisional government on the 17th of that month. The proposition for annexation of the islands being rejected by President Cleveland, a constitutional convention was held in Honolulu, and on July 4, 1893, a republic was formally proclaimed, of which Judge Dole was elected president. After the annexation of Hawaii in 1898, he was one of the five commissioners appointed by President McKinley to recommend to Congress such legislation concerning the Hawaiian Islands as they should deem best, and was subsequently appointed governor of the islands. He retired in 1915.

DOLERITE, a variety of trap-rock, consisting of labradorite and pyroxene, with generally some magnetite. It may be either light colored crystalline, or granitoid, or dark-colored, compact, massive; either porphyrite or not, sometimes crypto-crystalline, and also a cellular

lava. It includes much of the so-called trap, greenstone, and amygdaloid.

DOLET, ETIENNE (dō-lā'), "the martyr of the Renaissance"; born in Orleans, France, in 1509. At the age of 12 Dolet went to the University of Paris, where his attention was directed to the study which became the chief interest of his life—the writings of Cicero. In 1534 Dolet left Toulouse for Lyons where he killed a person of the name of Compaing. Having received the royal pardon, he continued to reside in Lyons, always under strong suspicion of heresy. At length, in 1544, he was found guilty of heresy on a charge mainly based on an alleged mistranslation of Plato, in which he was accused of denying the immortality of the soul. After two years' imprisonment, Dolet was burned in the Palace Maubert, Paris, Aug. 3, 1546.

DOLICHOCEPHALIC, long-headed; an epithet applied to those human skulls in which the transverse diameter or width from side to side bears a less proportion to the longitudinal diameter, or width from front to back than 8 to 10. Such are the skulls of the west African negroes.

DOLICHOS, a genus of papilionaceous plants, tribe *Phaeseoleæ* sub-tribe *Euphaseoleæ*. As founded by Linnæus it included many species now transferred to other genera; it is now limited to those which have a linear legume, with incomplete cellular dissepiments, and ovate seeds with a small oval hilum. Even when thus restricted it contains about 70 known species, which are from the tropics of both hemispheres. The legumes of *D. sesquipedalis* are eaten in the S. of Europe. *D. lignosus* is one of the most common kidney beans in India. *D. unifloris* is the horse gram of the same country. The tuberous root of *D. tuberosus* is eaten in Martinique. The legumes of various species now removed to other genera are eaten.

DOLICHOSOMA, an amphibian of the Carboniferous period. It is divided by Cope into the genera of *Phlegethontia* and *Molgophis*. Fossils have been found in Ohio and Nova Scotia. The Ohio specimens were imbedded in cannel coal formations indicating lake-like conditions during the life of the species.

DOLIUM, the tun, a genus of gasteropodous mollusca, family *Buccinidæ*. The shell is ventricose, spirally furrowed, with a small spire and very large aperture, the outer-lip cremated, and no operculum; known species, 14 recent, from the Mediterranean, the India and China seas, and the Pacific. Fossil species from the Tertiary, if not even commencing with the chalk.

DOLLAR [an adaptation of the German *thaler*, which is itself an "abbreviation of Joachimsthaler, a coin so called because first coined from silver obtained from mines in Joachimsthal (*i. e.*, Joachim's dale), in Bohemia, about 1518; they were sometimes called Schlickenthaler, because first coined by the counts of Schlick, a favorite coin, found under different names in almost every part of the globe.] The following are the principal dollars in circulation:

(1) A gold coin of the United States; weight, 25.8 grains; fineness, .900; now no longer coined in pieces of one dollar but in multiples of the standard.

(2) A silver coin of the United States.

(3) A silver coin current in Mexico; fineness, .900; weight, 27.067 grammes, or 417.7 grains.

(4) The unit of value in Canada, represented by paper only, Canada having no coinage of its own.

(5) The English name of a silver coin in circulation in many other countries, as Norway, Sweden, Denmark, etc. In many cases the name is different, thus, the Spanish dollar is also called *piastre*, or *duro;* that of Peru, the *sol;* that of Chile, the *peso*, etc.

The value of a dollar is the unit employed in reckoning money in the United States.

The sign $, now generally used to signify a dollar, is commonly supposed to date from the time of the celebrated Pillar dollar of Spain. This dollar was known as the Piece of Eight (meaning eight reals), and the curved portion of the sign is a rude representation of the figure 8. The two vertical strokes are thought to be emblematical of the Pillars of Hercules, which were stamped upon the coin itself.

DOLLART, THE, a gulf of the German Ocean, at the mouth of the river Ems, between Hanover and Holland. It is 8 miles long by 7 broad, and was formed by inundations of the sea (1277-1362), which submerged 50 villages and several towns. In recent times much territory, especially on the flat German coast, has been won back from the sea.

DOLLIVER, JONATHAN, PRENTISS, United States Senator from Iowa, born in Preston county, W. Va., in 1858. He graduated from the University of West Virginia in 1875 and after studying law was admitted to the bar in 1878. He took an active part in politics and became well known as an orator. From 1899 to 1900 he was a member of Congress and in 1901 was appointed United

States Senator to fill an unexpired term. He was elected to the Senate from 1901 to 1907, and from 1907 to 1913. He was one of the most powerful and aggressive of the progressive group of Senators which opposed the conservative or reactionary policies of the Republican party. His efforts against the Payne-Aldrich Tariff Bill in the Senate in 1910 hastened his death which occurred in the same year.

DOLOMITE (named after D. Dolomieu, a French mineralogist), a brittle subtransparent or translucent mineral, of a white, reddish, or greenish-white, brown, gray, or black color, with a vitreous luster. There are numerous varieties. Dolomite constitutes extensive strata, with limestone strata, in various regions. M. Dolomieu in 1791 announced its marked characteristics, its not effervescing with acids while burning like limestone, and soluble after heating in acids.

DOLOMITE MOUNTAINS, or **DOLOMITE ALPS**, a group of European mountains belonging partly to Tyrol, partly to north Italy, and having the Piave and Rienz on the E., the Adige and Eisack on the W. They are named from the prevalence of the mineral dolomite. The highest summits are Palle di San Martino (10,968 feet); Sorapiss (10,798), and Monte Tofana (10,715).

DOLPHIN, a cetaceous animal, forming the type of a family (*Delphinidæ*) which includes also the porpoises and narwhal. Dolphins are cosmopolite animals inhabiting every sea from the equator to the poles; they are gregarious, and swim with extraordinary velocity. The common dolphin measures from 6 to 10 feet in length, has a long sharp snout with numerous nearly conical teeth in both jaws; its flesh is coarse, rank, and disagreeable, but is used by the Laplanders as food. It lives on fish, mollusca, etc. The animal has to come to the surface at short intervals to breathe. The blow-hole is of a semilunar form, with a kind of a valvular apparatus, and opens on the vertex, nearly over the eyes. The structure of the ear renders the sense of hearing very acute. One or two young are produced by the female, who suckles and watches them with great care. The name is also commonly but improperly given to a fish, *Coryphæna hippuris*, a member of the mackerel family, the beauty of whose colors when dying has been much celebrated by poets. They abound within the tropics.

DOLPHIN, BLACK, a species of *Aphis*, or plant-louse, which infests the bean, and often does considerable injury to crops, sucking the juices of the plants and preventing the development of flower-buds. It is of a dull black or dark-green color, the young spotted with silvery white.

DOMAIN, PUBLIC, in the United States, the vacant public land. The following gives an approximate estimate of the quantity of these lands, together with the area reserved and appropriated, in the several land districts at the close of the fiscal year ending June 30, 1920.

State	Area in acres		
	Surveyed.	Unsurveyed.	Total.
Alabama	37,200	.....	37,200
Arizona	6,643,509	11,625,400	18,268,909
Arkansas	276,595	.....	276,595
California	15,237,248	4,348,553	19,585,801
Colorado	7,364,231	1,576,954	8,941,185
Florida	120,077	.....	120,077
Idaho	5,628,945	3,176,167	8,805,112
Kansas	4,346	.....	4,346
Louisiana	14,240	.....	14,240
Michigan	73,523	.....	75,523
Minnesota	256,297	.....	256,297
Mississippi	33,360	.....	33,360
Missouri	18	.....	18
Montana	3,964,156	2,009,585	5,973,741
Nebraska	66,844	.....	66,844
Nevada	31,457,972	22,809,203	54,267,175
N. Mexico	14,915,870	3,533,008	18,448,878
N. Dakota	81,044	.....	81,044
Oklahoma	7,404	.....	7,404
Oregon	13,259,365	747,392	14,006,757
S. Dakota	259,073	29,399	288,472
Utah	13,316,198	16,675,517	29,991,715
Washington	784,571	302,115	1,086,686
Wisconsin	5,154	.....	5,154
Wyoming	18,017,735	1,661,860	19,679,595
Grand total	131,824,975	68,495,153	200,320,128

DOMBOC (book of dooms or sentences), the code of laws compelled by King Alfred, begins with extracts from the Bible. Then follow the Ten Commandments, the part of the Mosaic law relating to criminal offenses, and passages from the New Testament, including the golden rule. The code was ratified by the Witan. Thorpe gives it in his "Diplomatarium Anglicanum ævi Saxonici" (English Diplomatarium of the Saxon Era) (1865).

DOME, though often used synonymously with cupola, a dome, in the stricter sense, signifies the external part of the spherical or polygonal roof, of which the cupola is the internal part. In Italian usage, however, it has a wider signification, being used to denote the cathedral or chief church of a town, the house (domus) par excellence, or house of God. The cause of the name of the building being thus applied to the form of the roof which covered it arose from the fact that the chief churches of Italy were at one period almost universally so roofed. It

was at Constantinople and in the Byzantine provinces that the dome was first employed in ecclesiastical structures. But it was the Romans who, in reality, were the inventors of the dome, as of all the other applications of the semi-circular arch. Of their success in applying it to large buildings we have abundant proof in the ancient domes still to be seen in Rome and its neighborhood. The dome of the Pantheon is still probably the most magnificent dome in existence. The dome of St. Peter's, Rome; of St. Paul's, London; of the Capitol, Washington; and of the old Boston State House, are notable examples also.

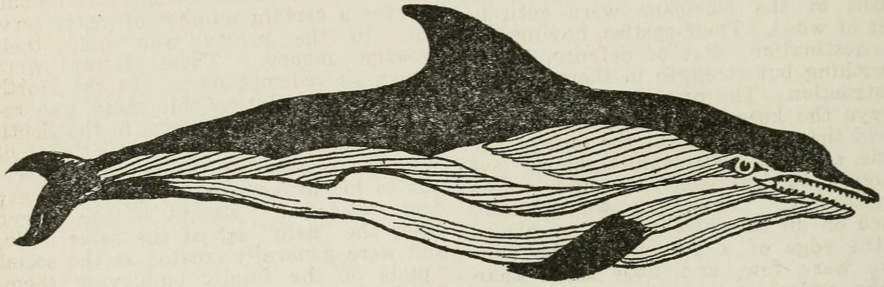
The following are the dimensions of some of the most important existing domes:

	Feet diam.	Feet high.
Pantheon at Rome	142	143
Baths of Caracalla, Rome	112	116
St. Sophia, Constantinople	115	201
St. Maria delle Fiore, Florence	139	310
St. Peter's, Rome	139	330
St. Paul's, London	112	215
Capitol, Washington	96	220
St. Genevieve, Paris	67	190

DOMENICHINO (dō-men-ē-kē'nō), a celebrated Italian painter, whose real name was DOMENICO ZAMPIERI; born in Bologna, 1581. He studied first under Denis Calvert, and then in the school of the Caracci. At about the age of 20 he went to Rome, where he acquired a great reputation, especially by his fresco of the "Flagellation of St. Andrew." He spent the latter part of his life at Naples. His chef-d'œuvre is the "Communion of St. Jerome in the Church at Bethlehem," now placed in the Vatican, opposite "The Transfiguration" of Raphael. "The Martyrdom of St. Agnes," "Martyrdom of St. Sebastian," and his scenes from the life of the Virgin, are among his finest works. Domenichino was one of the victims of the malignant persecuting triumvirate of painters at Naples, where he died April 15, 1641.

DOME OF THE ROCK, a name conferred on the Mosque of Omar, Jerusalem. It stands on Mount Moriah, on the site once occupied by the Temple of Solomon. Immediately under its dome an irregular-shaped rock projects above the pavement. This rock was the scene of many scriptural events, and has been greatly revered for ages.

DOMESDAY BOOK, one of the most ancient and valuable records of England, framed by order of William the Conqueror, to serve as the register from which judgment was to be given upon the value, tenure, and service of lands therein described. According to some



DOLPHIN

historians, the survey was begun in 1080 or 1083; according to others, at the close of 1085. The book itself records its completion in 1086. The work appears to have been known by the other names of "Rotulus Wintoniæ (Roll of Winchester); "Liber de Wintonia" (Book of Winchester, in consequence of its being at one period preserved in that city); the "Liber Censualis Angliæ" (Rate-book of England); "Scriptum Thesauri Regis" (Record of the King's Treasury).

DOMESTIC ARCHITECTURE, a branch of the building art which has special reference to houses, villas, and edifices designed primarily for dwelling purposes.

Ancient Greek and Roman.—In general all the rooms were grouped on the ground floor, round an atrium or court, and a peristyle or hall, which two portions of the house had he most importance attached to them, because they constituted the favorite spot in summer on account of the breeze, and in winter on account of the sun. Both the Roman and Greek houses consisted of two divisions, but the meaning and employment of these divisions did not coincide; for whereas in Greek houses the front part constituted the andronitis or men's apartments, in Roman houses it formed the public part of the building, in which clients used to wait upon their patrons. The back part, on the contrary, was intended for the residence and real dwell-

ing-rooms of the family; while in the Greek houses the back was the gynaikonitis, or apartments for the women and domestics. The atrium, or court, formed the central part of the front of the house and the peristyle, or hall, the central part of the back, both being open to the air. Round these the rooms were grouped, and from these principally they derived their light. Behind the peristyle were the cubicula, or sleeping-rooms, and the triclinium, or dining-room, which was quite open to the peristyle.

Norman.—The towns and ordinary houses of the Normans were entirely built of wood. Their castles, having but one destination, that of defense, aimed at nothing but strength in their plan or construction. The principal feature was always the keep or donjon, which contained the apartments of the lord of the castle, and was also meant to be the last refuge of the garrison if the outer works were forced. The keep was usually raised on an artificial mound, or placed on the edge of a precipice. The windows were few, and little more than chinks, unless very high up, or turned to the court. The whole fortress was defended by a moat.

English.—Like the Saxons the Normans had built almost entirely in wood or timber frame-work, houses of stone being the exception. The troubled state of the country, however, led to the erection of numerous strong stone buildings or fortresses. Gradually, as civilization improved, the necessity for defense decreased, and the efforts of Edward I. to introduce and encourage the arts in England by bringing over choice workmen and artists from France led to a marked change in the style of architecture. The close of the 17th century brought with it a taste for a return to classical models, and an attempt was made to work out a national style combining to some extent the characteristics of the Tudor and the Classical. This is commonly known as "Queen Anne" style. The buildings are generally of brick, solid and heavy. The domestic architecture of the Georgian era is a very debased imitation of the Classical. In the present day there is no essentially characteristic architectural style.

American.—As a matter of course, in the earlier years of the existence of the Republic the architectural styles were drawn almost exclusively from English sources, and up to the outbreak of the Civil War, except in very few instances, the country did not contain any architecture of distinctive features. But with the return of peace and prosperity the arts began to flourish, and great attention was bestowed upon the construction and ornamentation of domestic buildings. Numerous styles have appeared, had their day, and then given way in rapid succession to others.

DOMESTIC SERVICE. Work done in the house by servants hired to perform duties assigned to them. It is generally held to include cooks, housekeepers, waiting-maids, butlers, chauffeurs, nurses, etc. The earliest servants in the United States were the negro slaves and those who paid for their transportation to the Colonies by becoming for a certain number of years servants to the people who paid their passage money. These latter were known as redemptioners. In the North after the Revolution this class was replaced by the free laborers, in the South by the negro slaves. Up until the Civil War the relation of the household servant to his or her employer was a very democratic one. Except in the larger cities the "help" sat at the same table, and were generally treated as the social equals of the family employing them. No badges of service such as a cap or livery were worn and the personal element entered into the service very largely. When, however, large numbers of unskilled laborers from foreign lands began to arrive in the United States this state of affairs was altered. From 1845-1860 Irish, German, and a little later Chinese unskilled laborers immigrated into the States, and household service was taken up by a great many of them. Obviously the same conditions of familiarity between the family and the servants could not continue, at least not in the Eastern States where the bulk of the immigrants stayed. In the Western section this democratic relationship still obtained, and does so to this day in the extreme frontier regions. Another factor to be reckoned with in the East was the opportunity offered increasingly to household servants of working in factories and establishments where there are fixed hours of labor and no curtailments of their personal freedom. An increasing distance between the family and the servants was maintained by the wealthy and badges of service again came into use, a feature largely unknown in the period before the Civil War. The working of factors above mentioned was stimulated by conditions brought about by the World War. An unprecedented demand for all sorts of labor was made by the Government and industrial establishments, and wages, until then unheard of, were offered. Large numbers of household servants accepted these offers, and those who did not stayed

only on very remunerative terms. The unrest which succeeded the war did nothing to solve the problem, if indeed it did not augment it. The present condition of the domestic servants in the United States as compared with other classes of labor is certainly good. The wages of a girl or woman doing the work of general housekeeping averages from twelve to fifteen dollars a week, and in addition she secures room and board. The only unsatisfactory part to the servant is the social inferiority which such a position carries with it and the somewhat longer hours. To remedy this last abuse the "shift" system—allowing each servant to work but eight hours—has been suggested and in some localities been put in force by the very wealthy. Co-operative housekeeping has been attempted by those whose means are limited, to cope with the problem of securing help. "Community kitchens" supply the food, control heating plants, do away with the necessity of janitor service, while modern electric equipment vastly reduces the time consumed in housework.

In England and on the Continent of Europe the conditions of labor of the household servant are not nearly so good. In most of these countries there is a class bred to service, and members of that class seldom aspire to a higher social status. This is more especially the case the farther eastward one goes in Europe, reaching its climax in nations such as Poland, Rumania, and Hungary, where the personal restrictions on the liberty of the servant remind one of the feudal serf. Prior to the Revolution in Russia much the same condition obtained there. Even in France or Germany the household servants are rather pleased to wear the white caps belonging to their order, while in America it remains one of the distasteful features of domestic service. In Germany at the termination of a servant's employment in the household the employer is obliged to enter a comment in a police book, stating how satisfactory that servant has been. In England domestic servants are hired by the year and the employer is free to discharge immediately and without any notice on the discovery of theft, immorality, extreme incompetence or disobedience. This practically leaves the servant at the mercy of the employer and this feature is one which is characteristic even in the United States. Wages in England and the Continent are considerably below those paid in the States. Seven and eight dollars a week secure the same amount of service in England which twice that amount could scarcely command in America.

DOMETT, ALFRED, an English poet; born in Surrey, England, May 20, 1811; said to have been the original of Browning's "Waring." He was a colonial statesman of eminence. His verse attracted much attention, the best specimens being in the volumes "Ranolf and Amohia" (1872), and "Flotsam and Jetsam: Rhymes Old and New" (1877). He died in London, Nov. 12, 1887.

DOMICILE. 1. The place of residence of an individual or a family; the place where one habitually resides, and which he looks upon as his home, as distinguished from places where one resides temporarily or occasionally. Domicile is of three sorts: (1) Domicile of origin or nativity, which is that of the parents at the time of the birth; (2) Domicile of choice, which is that place which a person voluntarily chooses as his residence and home; (3) Domicile by operation of law, as that of a wife acquired by marriage.

2. The length of time during which a party must have resided in a State in order to give jurisdiction in civil causes, the period varying in the different States.

The domicile of origin remains until another has been acquired. In order to change such domicile there must be an actual removal with an intention to reside in the place to which the party removes. When he changes it, he acquires a domicile in the place of his new residence, and loses his original domicile. Officers of the government whose public duties require a temporary residence elsewhere, retain their domiciles. Officers, soldiers, and marines, in the service of the United States, do not lose their domiciles while thus employed.

DOMINANT, in music, the fifth tone of the diatonic scale, and which assumes the character of a keynote itself when there is a modulation into the first sharp remove. Thus, G is the dominant of the scale C, and D the dominant of the scale of G.

Dominant chord, in music, that which is formed by grouping three tones, rising gradually by intervals of a third from the dominant or fifth tone of the scale. It occurs almost invariably immediately before the tonic chord which closes the perfect cadence.

DOMINGO, SANTO. See SANTO DOMINGO.

DOMINIAN, LEON, an American geographer, born in Constantinople, Turkey, in 1880. He graduated from Robert College, Constantinople, in 1898, and afterward took special courses in geology at the University of Liège. After traveling in Turkey, he became field

assistant of the United States Geological Survey in 1903, and in 1905-1907 was engaged in travel and exploration in southwestern United States and in Mexico. From 1912 to 1917 he was geographer and editorial writer for the American Geographical Society. In 1918 he carried on special investigations on boundary problems for the Department of State. He served at the American Peace Commission in Paris in 1919. He was a member of many geographical societies and was the author of "The Frontiers of Language and Nationality in Europe" (1917).

DOMINIC, SAINT, the founder of the order of the Dominicans; born in Calahorra, in Old Castile, in 1170. He early distinguished himself by his zeal for the reform of canonical life and by his success as a missionary among the Mohammedans. His attention having been directed to the Albigenses in the S. of France, he organized a mission of preachers against heresy in Languedoc. In 1215 he went to Rome to obtain the sanction of Pope Innocent III. to erect the mission into a new order of preaching friars. His request was only partiallly granted, and it was the succeeding Pope, Honorius III., who conferred full privileges on the Dominicans. He also appointed Dominic Master of the Sacred Palace or court preacher to the Vatican, an office which is still held by one of the order. Dominic died in Bologna in 1221, and was canonized in 1234 by Pope Gregory IX. St. Dominic is usually considered the founder of the Inquisition, but this claim is denied on the ground that two Cistercian monks were appointed inquisitors in 1198.

DOMINICA, the largest and extreme S. British island in the Leeward group of the Lesser Antilles; midway between the French islands of Martinique and Guadeloupe; area, 291 square miles; pop. about 37,000, mostly negro. The Caribs have become so intermixed with the negroes that the pure Carib, the "Franc Caribs," will soon be non-existent. They are very peaceable and retiring, and live on fish, and vegetables and fruits which they cultivate. Dominica is of volcanic origin, with many hot and sulphurous springs. The temperature is cool and even chilly in the mountains, but sultry on the coast. Rain falls nearly every month, and the annual rainfall is 83 inches. Nearly one-half of the surface consists of wooded mountains and deep ravines, and at one point the surface attains an elevation of 6,234 feet.

The rugged, broken, and precipitous character of Dominica is very disadvantageous to the settler, and has confined agriculture to a narrow strip along the coast. The principal product is sugar, but fruit, cocoa, and timber also are exported, and the fisheries are valuable.

The capital of the island is Roseau, a port on the W. coast, with a population of about 5,000. Dominica is a member of the Leeward Islands colony, and sends representatives to the general legislative council; but it has its own president, treasury, and local legislature. The majority of the inhabitants are Roman Catholics; religious equality now prevails. Dominica was discovered by Columbus, on his second voyage, on Sunday (whence its name Dominica—*i. e.*, "the Lord's Day"), Nov. 3, 1493. It was a source of strife to French and English till 1648, when it was formally declared by the treaty of Aix-la-Chapelle a neutral island; but in 1759 it was captured by England, and in 1763 ceded by France, who, however, held it again in 1778-1783, and in 1802-1814, when it was finally restored to England.

DOMINICAN. (1) One of a religious order called in some places Prædicantes or Preaching Friars, and in France Jacobins, from their first convent in Paris being in the Rue St. Jacobin. They took their ordinary name from their founder, Dominic de Guzman (afterward canonized under the name of St. Dominic). The new order was approved of in 1215 by Pope Innocent III., and confirmed in 1216 by a bull of Pope Honorius III., under the rule of St. Augustine, a rule to which they have adhered, though they subsequently adopted a white habit resembling that of the Carthusians, in place of their original black dress. They were under a vow of absolute poverty. In England they were called Black Friars, and in 1276 the Corporation of London gave them two streets near the Thames, where they erected a large convent, whence that part is still called Blackfriars. The Dominicans always took a principal part in the Inquisition. The Dominicans were the chief supporters of the doctrine of the Immaculate Conception.

(2) One of an order of nuns founded by St. Dominic under the same rules as the friars, but devoted to industry.

(3) One of an order of knights founded by St. Dominic, for the purpose of putting down heresy by force of arms.

Tertiaries of St. Dominic. — To the friars, nuns, and knights mentioned above, St. Dominic added, in 1221, the Tertiaries—persons who, without forsaking secular life or even the marriage tie, connected themselves with the order by undertaking certain obligations, such as to dress plainly, to live soberly, to

carry no weapon of offense, and to perform stated devotions. Similar orders existed in connection with the Franciscans and the Præmonstratensians. The members were entitled to be buried in the habit of the order.

DOMINION OF CANADA. See CANADA.

DOMINIS (dom'ē-nēs), **MARCO ANTONIO, DE,** a Dalmatian priest and scientist; born in the island of Arbe in 1566. He became in turn a physician, a Jesuit and Archbishop of Spalatro. He was the first to explain the rainbow. He denied the Pope's supremacy and later accepted it. He died in prison in Rome in 1624.

DOMINIUM, in Roman law, the right by which any one exercised control over property, and by which he was entitled to retain or alienate it at pleasure, as opposed to a mere life interest, or possessory or equitable right. Dominium direction, in feudal law, is the interest or superiority vested in the superior; and dominum utile is the interest or property vested in the vassal, as distinguished from that of the lord.

DOMINO, the name formerly given to the hood or cape worn in winter by priests while officiating in cold edifices. It is now used to signify a masquerade costume, consisting of an ample cloak with wide sleeves and a hood.

DOMINOES, a game played with small flat rectangular pieces of ivory, about twice as long as they are broad. They are marked with spots varying in number. When one player leads by laying down a domino, the next must follow by placing alongside of it another which has the same number of spots on one of its sides. Thus, if the first player lays down 6-4, the second may reply with 4-8, or 6-7, etc.; in the former case he must turn in the 4, placing it beside the 4 of the first domino, so that the numbers remaining out will be 6-8; in the latter case he must turn in the 6 to the 6 in like manner, leaving 4-7, to which his opponent must now respond. The player who cannot follow suit loses his turn, and the object of the game is to get rid of all the dominoes in hand, or to hold fewer spots than your opponent when the game is exhausted by neither being able to play. The game was invented in the 18th century.

DOMINUS, the Latin word which we commonly render by "lord," but which more properly signifies the master of a house, and his eldest son, as opposed to slave (*servus*). The term is applied by Christians to God and to Jesus as Himself God. The Scottish "dominie," in the sense of schoolmaster, is of course taken from it, as is the same term in America, where in some places it is the title of a minister of the Dutch Reformed Church, and in others is applied to Protestant clergymen generally.

DOMITIA (dō-mish'yä), a Roman empress; born in Gaul about 56 A. D. She was the daughter of Domitius Corbulo, a general of Nero's reign. She was married first to Ælius Lamia, but the Emperor Domitian took her for his wife. Finding that her new husband intended to have her executed she caused his assassination in 96 A. D. Her subsequent career is uncertain, although she is said to have died in Rome about 100 A. D.

DOMITIAN, TITUS FLAVIUS AUGUSTUS (dō-mish'yan), the last of the "Twelve Cæsars," and youngest son of the Emperor Vespasian; born in 51 A. D. He early displayed the licentiousness and cruelty of his disposition, and was kept—both by his father and by his brother, the noble Titus, who succeeded Vespasian—entirely apart from public life. When proclaimed emperor, on the death of Titus, which he is suspected of having accelerated, if not procured, he proved the wisdom of the restraint which had been put upon him by the ferocity of his conduct. Aspiring to military fame he was unsuccessful in his undertakings, and after his defeat by the Dacians, who compelled him to make a humiliating peace, his natural disposition, suspicious, savage, gloomy and morose, manifested itself in all its naked deformity. To be honorable and virtuous was to be a mark for destruction, the mere suspicion of patriotism a warrant for death. His bloody reign furnishes some of the most thrilling pages of Tacitus; and points with its keenest shafts the withering irony of the satirist Juvenal. After escaping from many conspiracies, the monster fell, on Sept. 18, 96, the victim of a plot in which his wife, Domicia, bore a prominent part.

DON (ancient, Tanaïs), a river of Russia, which issues from Lake Ivan-Ozero, in the government of Tula; and flows S. E. through governments Riazan, Tambov, Voronej, and Don Cossacks, to within 37 miles of the Volga, where it turns abruptly S. W. for 236 miles, and falls into the Sea of Azof; whole course nearly 900 miles. The chief tributaries are: Right bank, the Donetz and Voronej; left, the Khoper and Manitsch. Although not admitting vessels of much draught, the Don carries a large traffic especially during the spring floods, and a canal connects it with the Volga system of navigation. It has also very extensive and productive fisheries.

DON, a river of Scotland, county of Aberdeen, rising near the Banffshire border. It flows tortuously E. through the whole breadth of Aberdeenshire, and falls into the North Sea a little to the N. of Aberdeen, after a total course of 82 miles. Its salmon fisheries are of considerable value. Also, a river of Yorkshire, England, which rises near Cheshire, and joins the Ouse after a course of about 70 miles. It is navigable for small craft to Sheffield.

DON, or **DOM** (lord), a title originally assumed by the popes, from whom it descended to bishops and other dignitaries, and finally to monks. In France, the title dom was conferred on the Carlovingian kings; in Portugal and Brazil it is now the universal title of the higher classes. The Spanish don was originally confined to the nobility, but is now bestowed by courtesy as indiscriminately as the English Mr. or Esq. The feminine is doña (Ital. *donna*). The Dan in "Dan Chaucer" is a form of the same word, and we still speak of "college dons.'

DOÑA FRANCISCA, a German colony in the Brazilian state of Santa Catharina, lying between the Serra do Mar and the ocean, 14 miles inland from the port of São Francisco. Area, 550 square miles; pop. about 26,000. Chief town, Joinville.

DONALD, the name borne by a line of Scotch kings who lived in the early ages of the Christian era, and whose annals are stained with murder, treachery, and revolting vices. DONALD I. began his reign in 216; and the VIIIth, called the "Bane," was dethroned by Edgar Atheling in 1098.

DONALDSONVILLE, a town of Louisiana, the county-seat of Ascension parish. It is on the Mississippi river, and on the Texas and Pacific railroad. It is the center of an important agricultural region, with extensive sugar, lumber, cotton, and rice interests.

DONATELLO (properly, DONATO DI BETTO BARDI), one of the revivers of the art of sculpture in Italy; born in Florence between 1382 and 1387. His first great works in marble were statues of St. Peter and St. Mark, in the church of St. Michael in his native town, in an outside niche of which is also his famous statue of St. George. Along with his friend Brunelleschi he made a journey to Rome to study its art treasures. On his return he executed for his patrons, Cosmo and Lorenzo de' Medici, a marble monument to their father and mother, which is of high merit. Statues of St. John, of Judith, David, and St. Cecilia are among his leading works. He died in Florence in 1466.

DONATI, GIAMBATTISTA (dō-nä' tē), an Italian astronomer; born in Pisa, in 1826; was appointed in 1852 assistant at the observatory in Florence, of which he became director in 1864. Here he discovered, *inter alia*, the brilliant comet of 1858, which is known as Donati's comet. He afterward was instrumental in erecting the fine observatory at Arcetri, near Florence, and constructed a spectroscope of 25 prisms. He died Sept. 20, 1873.



DONATELLO

DONATIST, one of a sect of schismatics in Africa, the followers of Donatus, Bishop of Casa Nigra, in Numidia. The sect arose in A. D. 311, when Cæcilianus was elected Bishop of Carthage, and consecrated by the African bishops alone, without the concurrence of those of Numidia. The people, resenting this, refused to acknowledge Cæcilianus, and set up Majorinus, who was then consecrated by Donatus. The Donatists held that Christ, though of the same substance with the Father, yet was less than the Father; they also denied the infallibility of the Church, which they said had fallen away in many particulars. They were condemned in a council held at Rome A. D. 313, also in another at Arles in the following year; and a third time, in A. D. 316, at Milan, before Constantine the Great. At the end of the 4th century they had a large number of churches, but soon after began to decline, owing to a schism among themselves, occasioned

by the election of two bishops in the room of Parmenian, the successor of Donatus, and also through the zealous opposition of St. Augustine, Bishop of Hippo. They were finally suppressed in the 6th century by Pope Gregory the Great.

DONATUS, ÆLIUS (dō-nā'tus), a Roman grammarian and commentator; born A. D. 333. He was the preceptor of St. Jerome, wrote notes on Vergil and Terence, and a grammar of the Latin language so universally used in the Middle Ages that "Donat" became a common term for grammar or primer of instruction. From him must be distinguished a later grammarian, TIBERIUS CLAUDIUS DONATUS (about 400), from whom we have a worthless life of Vergil, prefixed to many editions of that poet, and fragments of a commentary on the "Æneid."

DONAUWÖRTH (dō-nou-vert), an ancient town of Bavaria; at the confluence of the Wörnitz and the Danube, 25 miles N. N. W. of Augsburg. It was formerly a free imperial city of considerable importance; but has now sunk into an insignificant place of about 6,000 inhabitants. In the Thirty Years' War it was twice stormed, by the Swedes and by the Bavarians. It is likewise associated with the name of Marlborough, who carried the intrenched camp of the French and Bavarians near here in 1704; and, on Oct. 6, 1805, the French, under Soult, obtained a victory here over the Austrians, under Mack.

DON CARLOS. See CARLOS.

DONCASTER, a municipal borough in the West Riding of Yorkshire, England, and an important railway junction, on the right bank of the Don. It has long been famous for its annual races, begun in 1703, and held a mile S. E. of the town in the second week of September. Colonel St. Leger, in 1776, founded stakes which have been yearly run for by the best horses in England. On an eminence 5 miles W. S. W. of Doncaster are the ruins of Conisborough Castle, the stronghold of Athelstan in Scott's "Ivanhoe." A Norman-Saxon round tower, it is 37 feet in diameter and 86 feet high, with walls 15 feet thick. Pop. (1919) 51,592.

DONEGAL, a town of Ireland, on the Eske river. It is in a rich agricultural region. It is surrounded on three sides by hills. Near the town are the ruins of Donegal Castle. The town is one of the most historic in Ireland. Pop. about 3,000.

DONGAN, THOMAS, Earl of Limerick; born in Castleton, Ireland, in 1634. After serving in the British and French armies and attaining the rank of colonel, he was appointed lieutenant-governor of Tangiers by Charles II. and colonial governor of New York by the Duke of York in 1682. He gave the city of New York its first charter in 1686 and being accused of ignoring his pacific instructions regarding the French and Indians, and of inciting the Five Nations to war, resigned his commission in 1688, returned to England in 1691, and inherited the earldom of Limerick in 1698. He died in London, Dec. 14, 1715.

DONGOLA, a province of Anglo-Egyptian Soudan, within the region formerly known as Nubia. Its surface is generally level and fertile and large quantities of wheat and dates are grown for export. The capital of the province is New Dongola on the west bank of the Nile. Old Dongola on the east bank of the Nile, about 75 miles above, was formerly an important town, but is now no more than a village. The province has railroad connection with Egypt, Khartum, and the Red Sea by a line opened in 1906. Pop. about 60,000.

DONIPHAN, ALEXANDER WILLIAM, an American military officer; born in Mason co., Ky., July 9, 1808; graduated at Augusta College and began the practice of law in 1830 in Lexington, Mo. He was three times elected to the Missouri Legislature. He served in the Mexican War, in which he made a brilliant record, capturing Chihuahua, after an unexpected encounter with an army of 4,000 men. He was one of the Peace Commissioners at the convention which met at Washington previous to the Civil War, which it vainly sought to avert. He died in Richmond, Mo., Aug. 8, 1887.

DONIZETTI, GAETANO (dō-nē-dzet' tē), an Italian composer; born in Bergamo in 1798. He studied music at Bologna under the distinguished Abbé Mattei. His first opera, "Enrico di Borgogna," was represented at Venice in 1818. In 1822 his "Zoraïde di Granata" gained him the honor of being crowned on the Capitol. In 1830 appeared his "Anna Bolena," which first, along with "Lucrezia Borgia" and "Lucia di Lammermoor," the latter his masterpiece, acquired for him a European fame. In 1835 Donizetti was appointed Professor of Counterpoint at the Royal College of Naples, but removed in 1840 to Paris, bringing with him three new operas, "Les Martyrs," "La Favorita," and "La Fille du Régiment," of which the last two are among his most popular productions. Of his other operas none except "Linda di Chamouni" (1842) and "Don Pasquale" (1843) achieved any special triumph. He died April 8, 1848.

DONJON, the grand central tower of a Norman or mediæval castle, frequently raised on an artificial elevation. It was the strongest portion of the building, a high square tower with walls of enormous thickness, usually detached from the surrounding buildings by an open space walled, called the Inner Bailey, and another beyond called the Outer Bailey. Here, in case of the outward defenses being gained, the garrison retreated to make their last stand. The donjon contained the great hall, and principal rooms of state for solemn occasions, and also the prison fortress; from which last circumstance we derive the modern and restricted use of the word dungeon, Examples are seen in the White Tower, in the Tower of London, Rochester Castle, and in the Castle at Newcastle. It was also called the donjon-keep.

DON JUAN (whän) the hero of a Spanish legend which seems to have had some historical basis in the history of a member of the noble family of Tenorio at Seville. The legend has furnished the subject for many dramas and operas. The most famous of the latter is Mozart's "Don Giovanni." Among the former are "Don Juan ou Le Festin de Pierre," by Molière and "The Libertine," by Shadwell. The "Don Juan" of Byron bears no relation to the old story.

DONKEY ENGINE, a small engine used in various operations where no great power is required. Thus a donkey engine is often stationed on the deck of a ship to work a crane for loading and unloading.

DONNE, JOHN, a celebrated English poet and clergyman; born in London in 1573. He studied both at Oxford and Cambridge. In his 19th year he abjured the Catholic religion, and became secretary to the Lord-Chancellor Ellesmere, but finally lost his office by a clandestine marriage with his patron's niece. By the desire of King James, Donne took orders, and, settling in London, was made preacher of Lincoln's Inn. In 1621 he was appointed Dean of St. Paul's. He was chosen prolocutor to the convocation in 1623-1625. As a poet, and the precursor of Cowley, Donne may be deemed the founder of what Dr. Johnson calls the metaphysical class of poets. He wrote "Letters," "Sermons," "Essays on Divinity," and other pieces. He died in March, 1631, and was interred in St. Paul's.

DONNELLY, IGNATIUS, an American prose-writer; born in Philadelphia, Nov. 3, 1831. Among his writings are: An "Essay on the Sonnets of Shakespeare"; "Atlantis, the Antediluvian World" (1882); and "Ragnarok" (1883). In "The Great Cryptogram" he endeavors to prove that Francis Bacon was the author of Shakespeare's plays. His best known novel is "Cæsar's Column." He died in Minneapolis, Minn., Jan. 2, 1901.

DONNYBROOK, a former village and parish, now mostly embraced in the borough of Dublin, at one time celebrated for a fair (notorious for fighting) which was granted by King John, and abolished in 1855.

DONORA, a borough of Pennsylvania, in Washington co. It is on the Pennsylvania and the Pittsburgh and Lake Erie railroads, and on the Monongahela river. It is the center of an important coal mining and agricultural region, and has manufactures of steel wire, chemicals, gas mantles, etc. Pop. (1910) 8,174; (1920) 14,131.

DON QUIXOTE (kē-hō'tā), the title of a famous romance by Cervantes. The name of the hero, Don Quixote, is used as a synonym for foolish knight-errantry or extravagant generosity.

DOOM, the old name for the "Last Judgment," which impressive subject is usually painted over the chancel arch in parochial churches. Dooms were executed in distemper. One of the finest at present existing in England is in the Church of the Holy Trinity, in Coventry.

DOON, a river in Ayrshire, Scotland, which after a course of 30 miles falls into the Firth of Clyde. It is celebrated in the poems of Burns.

DOOR, a wooden or metal, or partly wood and partly metal frame, constructed so as to open and shut on hinges and close the entrance to a building, rooms, etc. The doors of ancient Egypt and contemporary nations swung upon vertical pintles which projected from the top and bottom of the door into sockets in the lintel and threshold respectively. The commonest form of door had the pintle in the middle of the width; so that, as it opened, a way was afforded on each side of it for ingress or egress. Double-margin doors are made in imitation of folding-doors, the middle style being made double with an intervening bead. Sliding-doors are an improvement on folding; they slip into grooves in the partition. A proper-ledged door is one made of boards placed side by side with battens called ledges at the back. With a diagonal piece at the back, in addition, it is said to be framed and ledged.

DOORGA, the appellation of a giant slain by Doorga, to whom, consequently, his name was transferred. In Hindu mythology the principal wife as well as

the mother of Siva, one of the gods belonging to the Hindu triad. The name Doorga is her appropriate appellation in Bengal, but in southern and western India she is generally Purwutee, or Parvati. Her great exploit was slaying the giant Doorga.

DOORNBOOM (thorn-tree), a common tree in the wastes of south Africa. The name given to it by the Dutch colonists and the botanical specific name (*Acacia horrida*) are due to the number and sharpness of its spines. It seldom much exceeds 30 feet in height, but its timber is hard and tough, and is much used for house-carpentry.

DOPPLERITE (named after B. Doppler, the first to bring it to notice), an amorphous mineral occurring in elastic or partly jelly-like masses found in peat-beds in Styria and Switzerland. When fresh it is brownish-black, with a dull brown streak and greasy subvitreous luster, insoluble in alcohol or ether. Dopplerite is also the name of a variety of hircite, grayish, earthy, and plastic in the fingers when fresh.

DOR, or **MONT DORE** (often written less properly Mont d'Or), a chain of mountains in France comprised in the great group of the Auvergne Mountains in the department of Puy-de-Dôme. They are clearly of volcanic formation, and rise in the Puy-de-Sancy, which is the highest peak of central France, to the height of 6,190 feet.

DOR, a negro people of central Africa, also called Bongo, between 6° and 8° N. lat., and bordering on the Dinka and Niam-Niam stocks.

DOR, or **DORR**, a species of beetle, belonging to the family *Geotrupidæ*, or earthborers. It is of a glossy violet, black, or deep greenish-black. The club of the antennæ is yellowish, the elytra smooth, but slightly punctuated, as is the thorax. It may often be seen flying about in the summer evenings. Its size and weight render it very unwieldy on the wing. The female lays its eggs in patches of cow-dung. It is about an inch long. It is also called dor or dorr-beetle, dor-fly, and buzzard-fly.

DORCHESTER, a municipal borough, the county town of Dorsetshire, England. In March, 1645, Cromwell held the town as his headquarters with 4,000 men, and in 1685 Judge Jeffreys held his "bloody assize" here, when 292 received sentence of death as being implicated in Monmouth's rebellion. Pop. about 10,000.

DORDOGNE (dor-dōn'), a department of France which includes the greater part of the ancient province of Périgord, and small portions of Limousin, Angoumois, and Saintonge. Area, 3,546 square miles. The chief minerals are iron, which is abundant, slate, limestone, marble, and other stone. Mining, iron manufacture, etc., are carried on to a considerable extent, and there are a number of vineyards. The climate is mild but somewhat changeable. Pop. about 440,000. The river DORDOGNE, principal river of the department, rises on the flanks of the Puy-de-Sancy, flows W. S. W., and after a course of 290 miles unites with the Garonne in forming the Gironde.

DORDRECHT. See DORT.

DORÉ (dō-rā), **PAUL GUSTAVE**, a French draughtsman and painter; born in Strassburg, Jan. 6, 1833. He studied at Paris, contributing, when only 16 years of age, comic sketches to the "Journal pour Rire." He distinguished himself greatly as an illustrator of books. His illustrations of "Rabelais," of Perrault's "Tales," Sue's "Wandering Jew," Dante's "Divina Commedia," and Cervantes's "Don Quixote," displayed a great fertility of invention. His illustrations of the Bible, of Ariosto's "Orlando Furioso," and Milton's "Paradise Lost," are also of high excellence. As a painter he had grandeur of conception and a bold expressive style. Among his chief works are "Christ leaving the Prætorium," "Paolo and Francesca di Rimini," "The Flight into Egypt," etc. In later years Doré also won fame as a sculptor. He died Jan. 23, 1883.

DOREMUS, ROBERT OGDEN, an American chemist; born in New York City, Jan. 11, 1824. He was graduated at New York University in 1842, and from its medical department in 1850, having established his chemical laboratory in New York in 1848. He has filled the chair of chemistry at Bellevue Hospital Medical College and at the College of the City of New York. He patented noted chemical processes and fire extinguishers and was a noted expert in toxicology. He died March 22, 1906.

DORIA, one of the most powerful families of Genoa, became distinguished about the beginning of the 12th century, and shared with three other leading families, the Fieschi, Grimaldi, and Spinola, the early government of the republic. Among the older heroes of this family are OBERTO DORIA, who in 1284 commanded the Genoese fleet, which at Meloria annihilated the power of Pisa; LAMBA DORIA, who in 1298 defeated the Venetian Dandolo at the naval battle of Curzola; PAGANINO DORIA, who in the middle of the 14th century distinguished himself by great victories over the Vene-

tions. But the greatest name of the Dorias is that of ANDREA, born in Oneglia in 1468, of a younger branch of the family. After serving some time as a condottiere with the princes of southern Italy, he was intrusted by the Genoese with the reconstruction of their fleet. Disagreement with the Genoese factions drove him to take service with Francis I., of France, in which he highly distinguished himself, and in 1527 he took Genoa in the name of the French king. But being displeased with the projects of Francis for reducing Genoa to a place of secondary importance he went over to the service of Charles V. (1529), carrying with him the whole influence and resources of Genoa. He re-established order in Genoa, reorganized the government, and though refusing the title of doge practically controlled its affairs to the end of his life. As imperial admiral he performed many services for Charles, clearing the seas of Moorish pirates and assisting the emperor in his expeditions to Tunis and Algiers. In 1547 his authority was threatened by the conspiracy of Fieschi, and he narrowly escaped assassination in the tumult. He died in 1560.

DORIANS, one of the great Hellenic races who took their name from the mythical Dorus, the son of Hellen, who settled in Doris; but Herodotus says that in the time of King Deucalion they inhabited the district Phthiotis; and in the time of Dorus, the son of Hellen, the country called Histiæotis, at the foot of Ossa and Olympus. But the statement of Apollodorus is more probable, according to which they would appear to have occupied the whole country along the N. shore of the Corinthian Gulf. Indeed, Doris proper was far too small and insignificant a district to furnish a sufficient number of men for a victorious invasion of the Peloponnesus. In this remarkable achievement they were conjoined with the Heracleidæ, and ruled in Sparta. Doric colonies were then founded in Italy, Sicily, and Asia Minor.

DORIAN MODE, or **DORIC MOOD**, the first of the authentic church tones or modes, from D to D, with its dominant A.

DORIC LAND, Greece, Doris being an important part of it.

DORIC ORDER, in architecture, the second of the five orders, being that between the Tuscan and Ionic.

Grecian Doric.—The earliest and most simple form of columnar edifice. The Doric column was first adapted to edifices having the proportions, strength, and beauty of the body of a man. A man was found to be six times the length of his foot, hence the plain doric columns were made six diameters in height. The Greeks composed their beautiful temples on this idea, and their simplicity and harmony are remarkable.

Roman Doric.—An imitation of the Grecian, but in some of the best examples the column is eight times the diameter in height; the shaft is quite plain except fillets above and below with escape and corvetto, and it diminishes one-fifth of its diameter. The capital is four-sevenths of a diameter high, and is composed of a torus which forms the hypotrachelium, and with the necking occupies one-third of the whole height; three deep fillets with a quarter-round molding are intended to represent the ovula and annulets of the Greek capital. The doric order, says Palladio, was invented by the Dorians and named from them, being a Grecian people which dwelt in Asia.

The ancients employed the doric in temples dedicated to Minerva, to Mars, and to Hercules, whose grave and manly dispositions suited well with the character of this order. Serlio says it is proper for churches dedicated to Jesus Christ, to St. Paul, St. Peter, or any saints remarkable for their fortitude in exposing their lives and suffering for the Christian faith. The height of the doric column, including its capital and base, is 16 modules; and the height of the entablature, 4 modules; the latter of which being divided into eight parts, two of them are given to the architrave, three to the frieze, and the remaining three to the cornice.

DORIS, a word of several applications, (1) The name of a country in Greece, S. of Thessaly, from which it was separated by Mount Œta. Also a colony of the Dorians in Asia Minor, on the coast of Caria. (2) A goddess of the sea, daughter of Oceanus and Tethys, and wife of Nereus, by whom she had 50 daughters, called Nereids. (3) An asteroid, the 48th found. It was discovered by Goldschmidt, on the date on which Pales was first seen by the same distinguished astronomer. (4) A genus of gasteropodous mollusks, the typical one of the family *Doridæ*. About 100 species are known.

DORKING, a town in Surrey, England, 22 miles S. W. of London, noted for its breed of fowls. It is the scene of the fictitious "Battle of Dorking," an imaginary narrative of invasions and conquest of England by a foreign army, written by Gen. Sir George T. Chesney in 1871.

DORMANT, in heraldry, in a sleeping posture.

DORMER WINDOW, a window piercing a sloping roof, and having a vertical frame and gable of its own. The gable is sometimes in the plane of the wall, or is founded on the rafters; sometimes a succession of stories on the roof are provided with dormers.

DORMOUSE, a small European mammal, which has been elevated into the type of a family, *Myoxidæ*, having a greater affinity to the *Sciuridæ* (squirrels) than to the *Muridæ*, and some place them under the former family. The name dormouse refers to the torpid state in which it passes the severe part of the winter, hence it has even been called the Sleeper.

DORNICK, a species of figured linen, named from Tournay or Doornik in Flanders. The "mystery," introduced into England, was long confined by law to inhabitants of Norwich and Pulham.

DORPAT, or **DERPT**, a town of Esthonia. The university, founded in 1632, by Gustavus Adolphus, was re-established by Alexander I. in 1802, and since May, 1887, has been thoroughly Russianized, the final reorganization of the law faculty taking effect in 1889. Dorpat was a Hanse town in the 14th and 15th centuries, and was alternately captured by the Swedes, Poles, and Russians till 1704. Now called Yuriev. Pop. about 45,000.

DORRANCETON, a borough of Pennsylvania, in Luzerne co. It is opposite Wilkes-Barre, and on the Susquehanna river, and on the Delaware, Lackawanna and Western railroad. It is entirely a residential city. Pop. (1910) 4,016; (1920) 6,334.

DORSANES, the Indian Hercules.

D'ORSAY, ALFRED, COMTE, a French leader of fashion; born in Paris, Sept. 4, 1801. He entered the army at an early age, and was quartered at Valence in 1822, when he became acquainted with Lord and Lady Blessington, and renounced his military career for their society. In 1827 he married Lord Blessington's only daughter by a first marriage, but a separation followed, and Lord Blessington having died in Paris in 1829, D'Orsay returned to England with Lady Blessington, where they became the center of a highly distinguished circle. He displayed considerable artistic talent and taste, both as a painter and sculptor. Having shown kindness and hospitality to Louis Napoleon when an exile in London, D'Orsay after the coup d'état of 1852 was nominated Directeur des Beaux Arts, but he did not live to enjoy it. He died in Paris, Aug. 4, 1852.

DORSE (*Morrhua Callarius*), a fish of the cod genus, called also Baltic cod.

DORSET, or **DORSETSHIRE**, a county of England, in the southern part. It is situated on the English Channel, between Devonshire and Hampshire, and has an area of 987.9 square miles. The chief industries are agriculture and stock-raising. Along the coast are many of the most popular watering places of England, including Lyme Regis, Bridport, and Lulworth. The capital is Dorchester. Population of the county, about 225,000.

DORSET, EARLS OF. See SACKVILLE.

DORSETIAN DOWNS, THE, the uplands of Dorsetshire, England.

DORSTENIA (named after Dr. T. Dorsten, a German botanist), a genus of plants belonging to the natural order *Urticaceæ*. The receptacle is slightly concave and broad, bearing numerous naked flowers. *D. contrayerva*, *D. houstoni*, and *D. brasiliensis* furnish the contrayerva root of commerce. They are natives of tropical America. The rhizome is used as a stimulant tonic, and diaphoretic.

DORT, or **DORDRECHT**, a town of the Netherlands, in the province of South Holland; on an island formed by the Maas, 10 miles S. E. of Rotterdam. An inundation in 1421, in which upward of 70 villages were destroyed and 100,000 people drowned, separated the site on which Dort stands from the mainland. It is one of the oldest, as in the Middle Ages it was the richest of the trading towns of Holland; and its trade is still considerable. Among its chief buildings are a Gothic cathedral (1363) and a handsome town hall (1339). The town is traversed by canals, and the largest ships are accommodated in its roomy harbor. Close by are a large number of shipyards, corn and saw mills, and manufactories of oil, sugar, ironwares, and machinery. Dort was founded in 1013. Here, in 1572, the states of Holland, after the revolt from Spain, held their first assembly; and sat from Nov. 13, 1618, to May 19, 1619, the conclave of Protestant divines known as the Synod of Dort, which condemned the doctrines of Arminius as heretical, and affirmed those of Calvin. Dort is the birthplace of the brothers De Witt, of Cuyp, and Ary Scheffer; to the last a statue was erected in the market-place in 1862. Pop. (1918) 53,828.

DORTMUND (dort'mönt), a city of Prussia, province of Westphalia; on the Ems, 47 miles N. N. E. of Cologne. Its prosperity is due to its becoming the center of several important railway systems, to the extensive coal mines in the vicinity, and to the active manufactures of iron, steel, machinery, railway plant, etc. There are also a number of breweries, potteries, tobacco factories, chemical works, etc. It was once a free imperial Hanseatic town, and the seat of the chief tribunal of the Vehme. Pop. about 215,000.

DORUS, the eponymous ancestor of the Dorians.

DORY, a popular name for Zeus Faber, an acanthopterygious fish, the typical one of the family *Zeidæ*. It is found at times on the North Atlantic coasts and is much esteemed for eating. It is very commonly called John Dory, which is a corruption of the French *Jaune-dorée* = *golden-yellow*. Also a small two-oared boat used by fishermen and 'longshoremen.

DOSITHEANS (from their founder, Dositheus), a sect founded by Dositheus, whose life and labors were in Samaria. The popular belief is that he was the first Christian "heretic." He is said to have been very rigid in his Sabbatarianism. His other opinions were partly Samaritan, partly Sadducean.

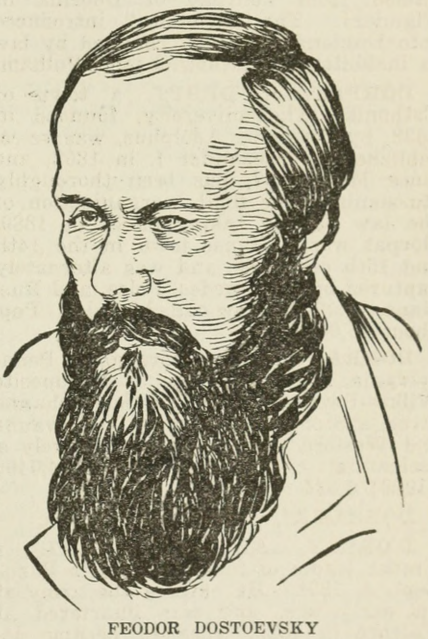
DOSTOEVSKY, FEODOR MICHAILOVITCH (dōs-tō-yev'skē), a Russian novelist; born in Moscow, Nov. 11, 1821. His first book, "Poor Folk" (1846) is an example of his talent for psychological analysis. He was condemned to the Siberian mines in 1849 for a socialist conspiracy, but in 1859 returned to St. Petersburg and resumed literary work. The thrilling "Memoirs of a Dead House," describes penal life in Siberia. His most celebrated novel is "Crime and Punishment" dramatized in France and the United States. "Complete Works," 14 volumes. There are translations of all of his works. He died in St. Petersburg, Feb. 8, 1881.

DOTHAN, a city of Alabama, the county-seat of Houston co. It is on the Atlantic Coast Line, the Central of Georgia, and the Atlanta and St. Andrews Bay railroads. It has important compressed cotton and fertilizer interests and manufactures of sashes and doors, ice, cotton-oil, and lumber. There are a library and other public buildings. Pop. (1910) 7,016; (1920) 10,034.

DOTO, one of the Nereids.

DOTTEREL, a species of plover which breeds in the N. of Europe, and returns to the S. for the winter. In Scotland it appears in April and leaves in August, the young being hatched in July. It is found all over Europe and northern Asia. Several species are represented in the United States, including the golden-plover, the kill-deer, and piping-plover.

DOUAUMONT, FORT, one of the outlying strongholds of Verdun, to whose capture the Germans devoted their main efforts during 1916 and 1917, their final failure signalizing their loss of the war. Fort Douaumont was termed by the Germans "the main pillar of the Verdun defenses," and had been captured by them in the last week of February, 1916. The fort was retaken by the Allied troops on May 22, 1916, only to be lost again two days later. On Oct. 24, 1916, the French recaptured it, after a furious engagement lasting several days.



FEODOR DOSTOEVSKY

DOUAY or **DOUAI**, an ancient French town, department of Le Nord, 108 miles N. by E. from Paris. Douay is the seat of a university, and possesses a good public library, containing upward of 36,000 volumes. Pop. about 36,000.

DOUAY BIBLE, the English version of the Bible translated by the students of the Roman Catholic college at Douay, under the auspices of Cardinal Allen, the founder of that seat of education. The work was published at Douay in 1609, about two years before the appearance of King James' authorized Protestant

Bible. The Douay version contains the Old Testament only, a translation of the New having been sent forth from the press at Rheims as early as A. D. 1582. The Douay version is the only English one which has obtained the sanction of the Pope.

DOUBLE BASS, or **BASE**, the largest of the stringed instruments played with a bow. Its invention is attributed to Gaspar di Salo, 1580. It is made with three or four strings. The strings are usually tuned a fourth apart to the notes F, B, E, when three strings are employed, with the addition of the lower E, when there are four strings.

DOUBLE BASSOON, the deepest-toned instrument of the bassoon family; also called contra-fagotto. It stands in the same relation to a bassoon as the double-bass does to the violoncello; that is to say, its sounds are actually an octave below those indicated. Its compass is from B flat below CCC to tenor F. The great masters have written for it largely. Haydn gives it an important part in several of his works, as do also Spohr, Beethoven, and Mendelssohn.

DOUBLE CONSCIOUSNESS, a mental condition in which two personalities entirely separate from one another are developed in one person. This morbid condition is shown to extreme in Stevenson's classic, "Dr. Jekyll and Mr. Hyde." While such antithesis of character is seldom met with in one person, yet psychologists have noted that when two personalities are in one body the two are in frequent contradiction to each other. The memory of what one personality has done is non-existent in the other. Dr. Prince of Boston found a woman who possessed three developed personalities, besides four which were but partially developed His explanation is that the subconscious life holds several potential personalities which are destroyed or developed in our conscious existence. Other psychologists are disposed to explain it as a physical condition existing in the nervous system or exaggerated motor automatism.

DOUBLEDAY, ABNER, an American military officer; born in Ballston Spa, N. Y., June 26, 1819. He was graduated at the United States Military Academy in 1842, rising to the rank of colonel in 1870 (brevet lieutenant-colonel in 1865). He was second in command at Fort Sumter in 1861, firing the first gun in its defense, and he greatly distinguished himself at Gettysburg. He died at Mendham, N. J., Jan. 26, 1893.

DOUBLE STANDARD, in economics the phrase double standard is used to signify a double standard of monetary value. It implies the existence of what is known as the gold standard on the one hand, and the silver standard on the other. Wherever the double standard in its integrity is in use a creditor is bound to accept payment of any sum in coins of either of the metals, gold or silver, which the debtor may choose to tender. See BIMETALLISM.

DOUBLE STARS and **MULTIPLE STARS**, stars which appear single to the naked eye, but in the telescope are resolved into two or more close together. There is no limit to the distance between these, but those whose components are more than 15″ or 20″ apart are not generally included in catalogues of double stars, and those whose distance is much less than 1″ require telescopes of large aperture to separate them distinctly. The discovery and measurement of the position-angles and distances of the components of these objects form almost a distinct department of astronomical observation, to which many able astronomers have given nearly all their lives. These measurements have shown that many of these doubles are true binary systems, the two components revolving round their common center of gravity in periods that range from 10 to 12 years, to unknown thousands and obeying, so far as these motions can show, the same law of gravitation that regulates the motion of the solar system. Sir William Herschel was the great pioneer in the field of discovery of these objects, but his measures were of comparatively little accuracy, and the elder Struve may be considered as the first astronomer to lay the foundation of this branch of research. The field of first discovery of these double stars has thus far been principally covered by five astronomers, and most of the known doubles are usually called by the catalogue number of the works or discovery lists of these five men, with a distinguishing letter for each, although it is very generally the custom to call the star by the catalogue number of the elder Struve if it is contained in the "Mensuræ Micrometricæ." These five astronomers, with their distinguishing letters, are as follows:

Herschel, Sir William.....H.
Struve, F. G. W.....Σ.
Herschel, Sir John.....h.
Struve, Otto.....O Σ.
Burnham, S. W.....β..

DOUBS (dö), a department of France, having Switzerland on its E. frontier. Its surface is traversed by four chains of the Jura. The land is arable, but much the greater part is covered with

forests. Maize, potatoes, hemp, flax, are the principal crops. Much dairy produce is made into Gruyère cheese. The minerals include iron, lead, and marble. Pop. about 290,000. The river Doubs rises in the department to which it gives its name, flows first N. E., then N. W., till it joins the Saône at Verdun-sur-Saône; length, 250 miles.

DOUGHERTY, DENNIS J., an American Roman Catholic prelate. He was educated at St. Charles Seminary, Overbrook, Pa., and in 1903 was appointed first American bishop of Neuva Segovia, Philippine Islands. He became bishop of Jaro, P. I., in 1908. He rendered remarkable service in the Philippines among the native troops. He remained there until 1915, when he was appointed bishop of Buffalo, and in July, 1918, was appointed archbishop of the See of Philadelphia and the Province of Philadelphia. He was one of the most conspicuous of Roman Catholic Church men, and in March, 1921, was appointed cardinal by Pope Benedict.

DOUGLAS, a city of Arizona, in Cochise co. It is on the El Paso and Southwestern railroad, and the terminus of the Nacozari railroad of Mexico. There are large copper smelters, and gypsum, cement, and plaster works. Pop. (1910) 6,437; (1920) 9,916.

DOUGLAS (dug'las), a family distinguished in the annals of Scotland. Their origin is unknown. They were already territorial magnates at the time when Bruce and Baliol were competitors for the crown. As their estates lay on the borders they early became guardians of the kingdom against the encroachments of the English.

The most distinguished members of the family are: JAMES, son of the William Douglas who had been a companion of Wallace, and is commonly known as the Good Sir James, early joined Bruce, and was one of his chief supporters throughout his career, and one of the most distinguished leaders at the battle of Bannockburn. He fell in battle with the Moors while on his way to the Holy Land with the heart of his master, in 1331.

ARCHIBALD, youngest brother of Sir James, succeeded to the regency of Scotland in the infancy of David. He was defeated and killed at Halidon Hill by Edward III. in 1333.

WILLIAM, son of the preceding, was created first earl in 1357. He recovered Douglasdale from the English, and was frequently engaged in wars with them. He died in 1384.

JAMES, the second earl, who, like his ancestor, was constantly engaged in border warfare, was killed at the battle of Otterburn in 1388. After his death the earldom passed to an illegitimate son of the Good Sir James, Archibald the Grim, Lord of Galloway.

ARCHIBALD, son of Archibald the Grim and fourth earl, was the Douglas who was defeated and taken prisoner by Percy (Hotspur) at Homildon, Sept. 14, 1402. He was also taken prisoner at Shrewsbury, July 23, 1403, and did not recover his liberty till 1407. He was killed at the battle of Verneuil, in Normandy, in 1427. Charles VII. created him Duke of Touraine, which title descended to his successors.

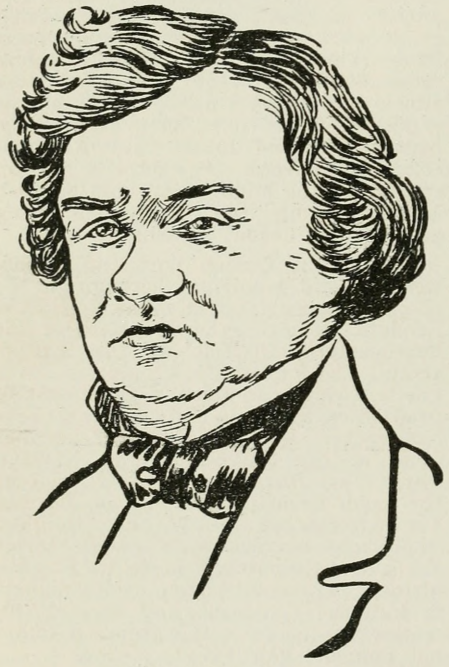
WILLIAM, sixth earl, born 1422, together with his only brother David was assassinated by Crichton and Livingstone at a banquet to which he had been invited in the name of the king, in Edinburgh Castle, on Nov. 24, 1440.

WILLIAM, the eighth earl, a descendant of the third earl, restored the power of the Douglases by a marriage with his cousin, heiress of another branch of the family; was appointed lord-lieutenant of the kingdom, and defeated the English at Sark. Latterly having entered into a treasonous league, he was invited by James II. to Stirling and there murdered by the king's own hand, Feb. 22, 1452.

JAMES, the ninth and last earl, brother of the preceding, took up arms with his allies to avenge his death, but was finally driven to England, where he continued an exile for nearly 30 years. Having entered Scotland on a raid in 1484 he was taken prisoner and confined in the abbey of Lindores, where he died in 1488. His estates, which had been forfeited in 1455, were bestowed on the fourth Earl of Angus, the "Red Douglas," the representative of a younger branch of the Douglas family, which continued long after to flourish. The fifth Earl of Angus, Archibald Douglas, was the celebrated " Bell-the-Cat," one of whose sons was Gawin Douglas the poet. He died in a monastery in 1514. Archibald, the sixth earl, married Queen Margaret, widow of James IV., attained the dignity of regent of the kingdom, and after various vicissitudes of fortune, having at one time been attainted and forced to flee from the kingdom, died about 1560. He left no son, and the title of Earl of Angus passed to his nephew, David. James Douglas, brother of David, married the heiress of the Earl of Morton, which title he received on the death of his father-in-law. His nephew Archibald, eighth Earl of Angus and Earl of Morton, died childless, and the earldom of Angus then passed to Sir William Douglas of Glenbervie, his cousin, whose son William was raised to the rank of

Marquis of Douglas. Archibald, the great-grandson of William, was raised in 1703 to the dignity of Duke of Douglas, but died unmarried in 1761, when the ducal title became extinct, and the marquisate passed to the Duke of Hamilton, the descendant of a younger son of the first marquis. The line of Angus or the Red Douglas is now represented by the houses of Hamilton and Home, who both claim the title of Earl of Angus.

DOUGLAS, STEPHEN ARNOLD, an American politician; born in Brandon, Vt., April 23, 1813. In 1834 he began the practice of law at Jacksonville, Ill.; was elected attorney-general of the State in the same year, member of the Legislature in 1835, Secretary of State in 1840, and Judge of the Supreme Court in 1841. He was elected to Congress in



STEPHEN A. DOUGLAS

1843, 1844, and 1846, and to the United States Senate in 1847, 1852, and 1858. In the Lower House he advocated the annexation of Texas and of Oregon up to 54° 40′ N. lat., and favored the war with Mexico, and in the Senate he opposed the ratification of the Clayton-Bulwer Treaty, and declared himself in favor of the acquisition of Cuba. On the question of slavery he maintained that the people of each territory should decide whether it should be a free State or a slave State. In 1860 he received the regular Democratic nomination for the presidency, the seceding delegates nominating John C. Breckinridge. Douglas obtained 12 electoral and 1,375,157 popular votes, as against 180 electoral and 1,866,352 popular votes cast for Lincoln, to whom, in the early days of the Civil War, he gave an unfaltering support. He died June 3, 1861, in Chicago.

DOUGLASS, FREDERICK, an American lecturer and journalist; the son of a negro slave; born in Tuckahoe, Md., in February, 1817. Though his father was a white man, he was, according to the law, reared as a slave. In 1832 he was purchased by a Baltimore ship-builder, but made his escape in 1838. As he had taught himself to read and write, and showed talent as an orator, he was employed by the Anti-slavery Society as one of their lecturers. In 1845 he published his autobiography, and afterward made a successful lecturing tour in England. In 1870 he started a journal entitled "The New National Era"; in 1871 he was appointed secretary of the commission to Santo Domingo; in 1872, presidential elector; and in 1877 marshal for the District of Columbia. He was commissioner of deeds for that district, 1881-1886; and United States Minister to Haiti in 1890. He died in Washington, D. C., Feb. 20, 1895.

DOUKHOBORS, a Russian sect of religious fanatics, which originated among the peasants of the Kharkov government, in 1733. The Russian Orthodox Church being very intolerant of any departure from its creed, the Doukhobors suffered a great deal of persecution, and were finally forced to colonize in Taurida. In 1890 the persecutions became so acute that great numbers of them fled abroad, the bulk of the refugees, nine thousand in number, finding refuge in Canada. Here they colonized in Manitoba, and caused the Canadian Government much trouble because of their unwillingness to conform to certain laws. The Doukhobors deny the divinity of Christ, the existence of the Holy Ghost, and tolerate neither priests nor church. They are unalterably opposed to war, and even to the killing of animals, so that they refuse to wear shoes made of leather. Gentle and harmless when allowed to lead their own manner of life, they have shown remarkable stubbornness when efforts have been made to force them to conform to general usage.

DOUMERGUE, GASTON, a French statesman. He was born at Aigues-Vives (Gard), in 1863, and was educated at the Lycée de Nîmes, and the Faculté de Droit of Paris. In 1885 he became advocate

at the Cour d'Appel of Nîmes, and was magistrate in Indo-China during 1890-1892. In 1893 he became magistrate in Algiers; deputy of Gard in 1893; and secretary of the Chamber of Deputies in 1895. During 1902-1905 he was Minister of the Colonies; 1905-1906 Vice-President of the Chamber of Deputies; 1906-1908, Minister of Commerce, Industry, and Labor; and 1908-1910, Minister of Public Instruction. In 1910 he became senator of Gard. During 1913-1914 he was President of the Council and Minister of Foreign Affairs. Since 1914 he has been Minister of the Colonies.

DOUM PALM, or **DOOM PALM**, a species of palm, a native of Egypt, remarkable for the manner in which its trunk divides dichotomously, the branches terminating in tufts of large fan-shaped leaves. The pericarp is about the size of an apple, and is used as food by the poorer classes. It has a taste resembling that of gingerbread, whence the tree itself is sometimes called the gingerbread-tree. The fibers of the leaf-stalks are made into ropes, and small ornaments are made of the seeds. An infusion of the rind is used in fevers, and as an aperient.

DOURO, one of the largest rivers of Spain and Portugal, rises in the Pico de Urbion (7,369 feet), in Old Castile, about 30 miles N. W. of Soria (3,445 feet above sea-level). From its source it flows S. E. to Soria, then winds toward the W. and pursues a general W. direction till it reaches the Portuguese border, when it flows S. W. for about 60 miles, forming the boundary between Spain and Portugal, and then flows W. through Portugal, entering the Atlantic below Oporto. Its Portuguese tributaries are comparatively small. The total length of the river is about 490 miles; it is navigable to Torro de Moncorvo, 90 miles.

DOVE, a river rising 4 miles S. W. of Buxton, England, and flowing S. and S. E. along the borders of Derbyshire and Staffordshire to the Trent, which it enters at Newton Solney, after a course of 45 miles. It was the favorite fishing stream of Izaak Walton, who lived here with his friend, Charles Cotton; and it is still beloved of anglers.

DOVE, the English appellation of the genus *Columbus*, or *Columba*. Thus the stock-dove is *Columbus* or *Columba ænas*, the ring-dove *C. palumbus*, the rock-dove *C. livia, and* the turtle-dove *C. turtur*. No very clear distinction is drawn between the words dove and pigeon, thus *C. livia* is often called the rock-pigeon instead of the rock-dove; yet *Ectopistes migratorius* is never called the migratory dove, but only the migratory pigeon.

Pl.: The order *Columbæ*. Sometimes it is made a sub-order of *Rasores*, in which case it is called *Columbacei* or *Gemitores*.

The dove in Christian art is the symbol of the Holy Ghost (Matt. iii : 16); as such, it is represented in its natural form, the body of a snowy whiteness, the beak and claws red, which is the color natural to those parts in white doves. The nimbus which always surrounds its head should be of a gold color, and divided by a cross, which is either red or black. A radiance of light invests and proceeds from the person of the dove, and is emblematical of the Divinity. It is also sometimes represented, in stained glass, with seven rays, terminating in stars, significant of the seven gifts of the Holy Ghost. The dove is the emblem of love, simplicity, innocence, purity, mildness, compunction; holding an olive-branch, it is an emblem of peace. Doves were used in churches to serve three purposes: (1) Suspended over altars to serve as a pyx. (2) As a type or figure of the Holy Spirit over altars, baptisteries, and fonts. (3) As symbolical ornaments. The dove is also an emblem of the human soul, and as such is seen issuing from the lips of dying martyrs and devout persons.

DOVER, a Cinque port and parliamentary and municipal borough in the E. of Kent, England, 66 miles E. S. E. of London. It is the headquarters of the Southeastern District of the British army. The fortifications comprise Dover Castle, which occupies a commanding position on the chalk cliffs, 375 feet above the level of the sea, and still includes some of the old Saxon and Norman work; Fort Burgoyne on the N. side of the town, Archcliffe Fort to the W., and the batteries on the Western Heights, where large barracks are situated. Dover holds a distinguished place in English history. Three submarine cables connect it with the Continent, and here an entrance was made to the proposed Channel Tunnel. Pop. (1919) 39,282.

DOVER, a city, capital of the State of Delaware, and county-seat of Kent co.; on Jones creek, and the Philadelphia, Washington, and Baltimore railroad, 75 miles S. of Philadelphia. It is the seat of Wilmington Conference Academy and has a handsome monument erected to the memory of Cæsar Rodney, one of the signers of the Declaration of Independence. It is the center of a great fruit-growing region; is on high ground; is laid out with wide, straight streets that cross each other at right angles; and is

built up chiefly with brick. Among its noteworthy buildings are a handsome State house, large court house, and new United States Government building. Connected with the State house is a State library with upward of 80,000 volumes. There are several churches, a National and a State bank, fruit evaporating and packing establishments, steam flour mill, foundry, machine shop, and sash, fruit crate, glass, and carriage factories.

DOVER, a city and county-seat of Strafford co., N. H.; at the head of navigation on Cocheco river, and on the Boston and Maine railroad; 168 miles N. N. E. of Boston. It is situated on hilly ground, is regularly laid out, and has many handsome buildings and residences. The river at this point has a depth of 11 feet, affording good shipping accommodations. The falls of Cocheco, within the city limits, are the source of abundant water power. Dover's industries include several large cotton and woolen mills, an extensive print works, manufactories of boots and shoes, oil cloth, hats and caps, and several tanneries, brass and iron foundries, and machine shops. There are several churches, high school, St. Joseph's Hill School, Franklin Academy, National banks, several savings banks, daily and weekly newspapers. There are monuments to persons distinguished in Revolutionary history. It is the oldest city in the State; settled in 1623; nearly destroyed by the Indians in 1689; and chartered as a city in 1855. Pop. (1910) 13,247; (1920) 13,029.

DOVER, a city in Morris co., N. J.; on the Rockaway river, the Lackawanna and the New Jersey Central railroads, and the Morris and Essex canal; 28 miles W. of Newark. It has extensive iron interests, railroad shops, machine shops, furnace and stove factories, and silk and hosiery mills. Five miles distant is a government powder magazine. Nearby are Lake Hopatcong, Mt. Arlington, Budd's Lake, and Schooley's Mountain, all noted summer resorts. The city has a high school, several churches, business college, daily and weekly newspapers, electric lights, and National bank. Pop. (1910) 7,468; (1920) 9,803.

DOVER, a city of Ohio, in Tuscarawas co. It was formerly known as Canal Dover. The city is on the Baltimore and Ohio, the Pennsylvania, and other railroads. It is an important industrial center and has a large plant of the United States Steel Corporation and several important coke and coal companies. It has also important plants for manufacturing electrical devices. Pop. (1910) 6,621; (1920) 8,101.

DOVER, STRAITS OF, the narrow channel between Dover and Calais which separates Great Britain from the French coast. At the narrowest part it is only 21 miles wide.

DOVER'S POWDER, a powder compounded of 10 parts each of ipecacuanha and powdered opium, and 80 parts of sulphate of potash. It is employed as a sudorific and sedative.

DOW, ARTHUR WESLEY, an American artist; born at Ipswich, Mass. He was educated in Boston and Paris. He exhibited in the Paris Salon in 1886-1887. He was for some time curator of Japanese art in the Museum of Fine Arts in Boston, and from 1895 to 1904 he was instructor in art at the Pratt Institute, Brooklyn, and instructor in composition at the Art Students' League from 1897 to 1903. From 1904 he was professor of fine arts in the Teachers' College, Columbia University. He wrote "Compositions" (1898), and published several books of color prints of especially high merit.

DOW, or **DOUW** (properly Dou), **GERARD**, a Dutch painter, the son of a glazier; born in Leyden, April 7, 1613. He studied under Rembrandt, and united his master's manner in chiaroscuro with the most minute finish and delicacy. His pictures are generally of small size and mostly scenes of family life. Dow died in Leyden in 1675.

DOW, NEAL, an American temperance reformer; born in Portland, Me., March 20, 1804. He was the author of the bill which prohibited the manufacture and sale of intoxicating liquors in the State of Maine, widely known as the "Maine Law." During the Civil War he was colonel of a Maine regiment and a Brigadier-General of volunteers. He died Oct. 2, 1897.

DOWAGIAC, a city of Michigan, in Cass co. It is on the Michigan Central railroad. It is the center of an important farming region, and its industries include flour and lumber mills, a canning factory, and a gas factory. It has a public library and manufactures of stoves, gloves, furnaces, etc. Pop. (1910) 5,088; (1920) 5,440.

DOWDEN, EDWARD, an Irish poet and historian; born in Cork, May 3, 1843. He was Professor of English Literature in Trinity College, Dublin. He published a volume of "Poems" (1876); his other writing are biological and critical, *e. g.*, "Shakespeare, his Mind and Art" (1872), a work of high authority, which reached a fifth edition (1887) and has been translated into

German; "Southey" (1879); "Life of Percy Bysshe Shelley" (1886); "Studies in Literature" (3d ed. 1887); "Introduction to Shakespeare" (1893); "Primer of French Literature" (1897); "Life of Browning" (1904); "Montayne" (1903); "Essays" (1910). He visited the United States in 1896, delivered a notable series of lectures at Princeton. He died April 4, 1913.

DOWER, the estate for life which a widow acquires in a certain portion of her husband's real property after his death. Dower, by the common law, which in this matter is the general law in the United States, entitles the widow to a third part of all the lands and tenements of which the husband was seized in fee-simple, or fee-tail, at any time during the coverture; but the rule varies widely on many particulars in the different States. Tenancy in dower is where a widow takes a third of such lands and tenements as her husband died entitled to, for seizin is not here necessary, and in which her title to dower has not been previously barred. This mode of providing for a widow seems to have been unknown in the early part of the Saxon constitution of England, from which country our laws are derived; for, in the laws of King Edmund, the wife is directed to be supported wholly out of the personal estate. Afterward, as may be seen in gavelkind tenure, the widow became entitled to an estate in one-half of the lands, provided she remained chaste and unmarried; as is usual also in copyhold dowers, or freebench.

DOWIE, JOHN ALEXANDER, adventurer; born in Scotland. At one time a pastor in Australia, he afterward went to Chicago, Ill., and became a "healer," real-estate operator, newspaper proprietor, and manufacturer. He founded a lace-making industry near Waukegan, Ill.; the place was called "Zion" and his folowers "Zionites." He announced that he was the prophet Elijah returned to earth, and surrounded himself with armed guards under a pretense that his life was in danger.

In October, 1903, Dowie and 3,500 of his followers journeyed to New York. The object was to gain recruits for the Dowie Church, and to induce New Yorkers to invest money in the Zion City enterprises. The crusade was a failure. He died March 9, 1907.

DOWLAS, a kind of coarse linen, very commonly worn by the lower classes in the 16th century; also a strong calico made in imitation of the linen fabric.

DOWNING STREET, a short street in Whitehall (named after Sir George Downing, Secretary to the Treasury in 1667), London, England, where are the Colonial and Foreign Offices, with the official residence since 1735 of the First Lord of the Treasury. Here cabinet councils are held, hence the term is sometimes employed for the government in office.

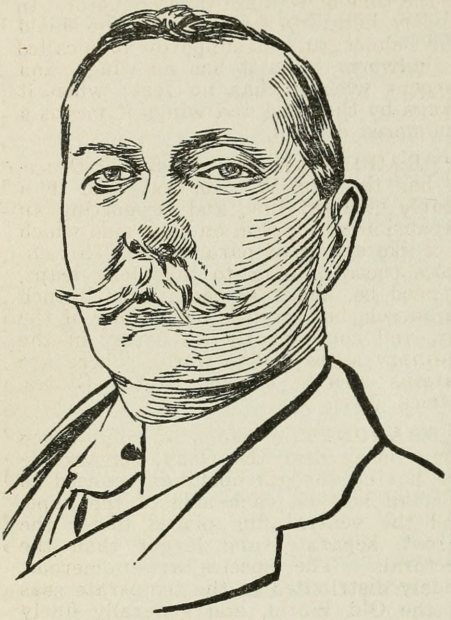
DOWNS, a term given to undulating grassy hills or uplands, specially applied to two ranges of undulating chalk hills in England, extending through Surrey, Kent, and Hampshire, known as the North and South Downs. The word is sometimes used as equivalent to dunes or sand-hills.

DOWNS, THE, an important roadstead or shelter for shipping, off the S. E. coast of Kent, England, opposite Ramsgate and Deal, between North and South Foreland, and protected externally by the Goodwin Sands; a natural breakwater with 1 to 4 fathoms water, and often partly dry at low tide. This large natural harbor of refuge is 8 miles by 6, with an anchorage of 4 to 12 fathoms. It is resorted to temporarily by outward and homeward bound vessels and squadrons of ships of war, and is unsafe only in S. winds. It is defended by Deal, Dover, and Sandown Castles.

DOYEN, CHARLES A., an American soldier; born in New Hampshire, in 1859. He graduated from the Naval Academy at Annapolis in 1883. He was appointed 2d lieutenant in the marine corps. After serving in the Spanish-American War he became fleet marine officer of the fleet. In 1904 he held a command in the Philippines and in the following year was appointed commander of the first brigade of the marines in the islands. He was appointed colonel in 1909 and in 1915 was in command of the Marine Barracks in Washington, D. C. He was appointed brigadier-general in 1917 and for a time saw service in France. He was transferred to command the Marine Corps Training Camp at Quantico, Va., where he died in 1918. He commanded the first regiment of marines sent to France in 1917. He was well-known as an expert in machine gunnery.

DOYLE, SIR ARTHUR CONAN, a Scotch story and romance writer; born in Edinburgh, May 22, 1859. He was carefully trained for a physician, but went to London at 20 and adopted literature as a profession. His greatest success was won with the series of detective tales known as the Sherlock Holmes stories: "The Adventures of Sherlock Holmes," etc. He also wrote : "The Adventures of Brigadier Gerard" (1895), a Napoleonic

romance: "The Stark Munro Letters" (1895); "Uncle Bernac" (1897); "The Tragedy of the Korosko" (1898); "Songs of Action" (1898); "Sir Nigel" (1906); "Songs of the Road" (1911); "A Lost



SIR ARTHUR CONAN DOYLE

World" (1912); "Valley of Fear" (1915); "His Last Bow" (1918); "History of the Great War" (1918-1919), etc.

DRACÆNA, a genus of *Liliaceæ*, tribe *Asparageæ*. Formerly, the genus was so defined as to include nearly or quite 30 species. The well-known *D. draco*, or dragon-tree, requires to be studied in its native country, the Canary Islands. Commencing as an unbranched endogen with linear entire evergreen sheathing leaves, which leave annular scars as they fall annually, it continues to advance slowly to maturity, the process, it is said, taking 25 to 30 years. Then the leaf scars are gradually obliterated, and branches begin to be put forth. Next a glorious panicle of inflorescence appears at the apex of the stem, the individual flowers of which, however, are small and greenish white. At an indefinitely long period it begins to decay. The celebrated dragon-tree of Teneriffe was one of the wonders of the world. Bethencourt in 1402 or 1406 described it as old and hollow. It had changed but little from that time till its destruction in 1867. It was between 70 and 75 feet high, with a circumference at the base of about 46½ feet. *D. draco* furnishes one of the resins called dragon's-blood. The tree called *D. Terminalis*, mentioned by Lindley and others as furnishing the Ti plant of the Sandwich Islands, was next named *Cordyline terminalis*, and is now denominated *Calodracon terminalis*.

DRACHENFELS (drä'chenfels) (Dragon's Rock), a peak of the range called the Siebengebirge, on the right bank of the Rhine, 8 miles S. E. of Bonn, Prussia. It has an elevation of 1,056 feet.

DRACHMA (drak'mä), **DRACHM** (dram), or **DRAM**, a silver coin, the unit of the money system in ancient Greece. It varied in value in different parts of Greece and at different times, but always remained the 6000th part of the talent, and 100th part of the mina, and was divided into six obols. The Attic drachma is estimated as equivalent to a French franc, or 19.3c in United States gold. The drachma (originally "a handful") was also the name of a weight, and 100 drachmas made a mina (nearly one pound) in weight, as in money.

DRACHMANN, HOLGER (dräch' man), a Danish poet, painter, and novelist; born in Copenhagen, Oct. 9, 1846. His works show a lively fancy and excel in descriptions of the life of the common people, especially fishermen and mariners. His "Poems" appeared in 1872. His novels include "Condemned," "Once Upon a Time," and "Sea Tales." His best known painting is "From Hamburg Harbor," which was presented by the Danes in Hamburg to the King and Queen of Denmark. Drachmann visited the United States in 1898. He died Jan. 13, 1908.

DRACO (drā'ko), an Athenian legislator, the extraordinary and indiscriminate severity of whose laws has rendered his name odious to humanity. During the period of his archonship, about 623 B. C., he enacted a criminal code in which slight offenses were punished as severely as murder or sacrilege. Hence it was said to be "written in blood." The laws of Draco, the first written laws of Athens, were for the most part superseded by the legislation of Solon. Draco is said to have been accidentally killed in a theater at Ægina.

DRACO, a constellation in the N. hemisphere. The star Draconis, a bright star nearly in the solstitial colure, was used in determining the co-efficient of aberration of the fixed stars.

DRACONTIUM, a genus of *Orontiaceæ*. *D. polyphyllum* is an antispasmodic and an expectorant. It grows in India,

Japan, etc. The American skunk cabbage was formerly referred to this genus; it is now called *Symplocarpus fœtidus*.

DRACUT, a town of Massachusetts, in Middlesex co. It is the center of an important agricultural region and its industries include woolen mills. Pop. (1910) 3,461; (1920) 5,280.

DRAFT, a written order for the payment of a sum of money addressed to some person who holds money in trust, or who acts in the capacity of agent or servant of the drawer. Documents of this kind often pass between one department of a bank or mercantile house and some other department, and are distinguished from bills of exchange and checks, in not being drawn upon a debtor.

DRAGO, LUIS MARIA, an Argentine lawyer. He was born at Buenos Aires, 1859, and was educated at the university of that city. He practiced law and became a judge at Buenos Aires, afterward being elected to Congress. He was Minister for Foreign Affairs under President Roca, and while in that position sent to the Argentine Minister in Washington the instructions known as the Drago Doctrine (1902). He was Argentine delegate to the Second Peace Conference and was one of the arbitrators nominated by agreement between Great Britain and the United States for the hearing of differences regarding fisheries off the North Atlantic coast. His works include: "La Literatura del Slang"; "La Idea del Derecho"; "Cobro Coercitivo de Deudas Publicas," etc.

DRAGON, a fabulous animal, found in the mythology of nearly all nations, generally as an enormous serpent of abnormal form. Ancient legends represent the dragon as a huge hydra, watching as sentinel the Garden of the Hesperides, or guarding the tree on which was hung the Golden Fleece at Colchis. In other places he appears as a monster, making the neighborhood around his cave unsafe, and desolating the land; his death being ascribed to a hero or god made for the task, which was a service to all mankind.

In Christian art the dragon is the usual emblem of sin; is met with in pictures of St. Michael and St. Margaret, when it typifies the conquest over sin; it also appears under the feet of the Saviour, and under those of the Virgin. The dragon also typifies idolatry. In pictures of St. George and St. Sylvester it serves to exhibit the triumph of Christianity over paganism. As a symbol of Satan we find the dragon nearly always in the form of the fossil Ichthyosaurus. The dragon appears on the shield of the most famous of the early Grecian heroes, as well as on the helmets of kings and generals. It is found on English shields after the time of William the Conqueror. In modern heraldry it appears on the shield and helmet; and as supporter it is called a lindworm when it has no wings, and serpent when it has no feet; when it hangs by the head and wings it means a conquered dragon.

DRAGON, the lizard, genus *Draco*. It has the first six ribs extended in a nearly straight line, and supporting an expansion of the skin on each side which acts like a pair of parachutes. This enables these animals to take long leaps, if need be, about 30 paces from branch to branch, but there is no beating of the air, and consequently no flying, in the ordinary sense of the word. There are various species in the United States, Africa, Java, etc.

DRAGONET, a genus of spiny-rayed bony fishes near the Goby, remarkable for having the gill openings reduced to a small hole on each side of the nape, and the ventral fins placed under the throat, separate, and larger than the pectorals. The species are numerous, widely distributed in the temperate seas of the Old World, and generally finely colored. The gemmeous dragonet (*C. lyra*) of the British coasts—called gowdie (gowd, "gold") in Scotland—is a fish about 10 or 12 inches long, and of a prevailing yellow color varied with spots of brown. At the reproductive season the male becomes very gorgeously adorned with blue and violet spots and stripes. This fish is also called skulpin or sculpin —a name given in the United States to a marine bullhead or cottus.

DRAGON FLY, a popular name given to the family *Libellulidæ*, the second family of the tribe *Subulicornia*, in which the hind wings are approximately of the same size as the anterior, a character which serves to distinguish them from the *Ephemeridæ*. Some 1,400 species have been described from all parts of the world. They are divided into three groups — *Agrionides*, *Æschnidæ*, and *Libellulides*, *Æschna grandis*, the great dragon fly, is nearly three inches long. *Libellula depressa* is the horse stinger, an insect nearly two inches long and of a yellowish-brown color.

DRAGON, GREEN, an araceous plant, with spotted petioles and handsome lobed leaves, and dark-colored fetid flowers, is common in Greece and other countries of southern Europe, and is occasionally to be seen in gardens.

DRAGON MOUNTAINS. See DRAKENBERGE.

DRAGON'S BLOOD, in botany a wing-leaved, slender-stemmed palm, similar in habit to that which furnishes the chair canes. It is a native of Sumatra and other Malayan islands. The fruits, which grow in bunches, are about the size of a cherry, and are covered with imbricating scales of a red color, coated with a resinous substance, which is collected by placing the fruits in a bag and shaking them; the friction loosens the resin, which is then formed into sticks or cakes, and constitutes the best dragon's blood of commerce.

In commerce, *sanguis draconis*, a resin, so called on account of its red color. It exudes from various trees, either spontaneously or from incisions. There are three kinds in commerce: (1) East Indian dragon's-blood, which is found on the ripe fruits and leaves of several palms of the genus *Calamus*—viz., *C. rotang*, *C. draco* and *C. Petrœus;* (2) American, obtained from incisions in *Pterocarpus draco*, indigenous to the West Indies; and (3) Canary dragon's-blood from *Dracœna draco*. Dragon's-blood is dark-red brown, opaque, tasteless, scentless, and brittle. When pure it dissolves with a fine red color in alcohol and in ether, and in oils both fixed and volatile; alkalies also dissolve it more or less completely. Nitric acid oxidizes dragon's-blood, forming oxalic acid, but dilute nitric acid heated with the resin, yields nitrobenzoic acid. Dragon's-blood is used for coloring varnishes, for preparing gold lacquers, for tooth tinctures, and for giving a fine red color to marble.

DRAGON'S HEAD, a genus of *Labiatæ*, common in gardens, so called from the form of its corolla.

DRAGON'S MOUTH, a popular name for antirrhinum, generally replaced in common usage by that of snap-dragon.

DRAGON TREE. See DRACÆNA.

DRAGOON, a kind of mounted soldier, so called originally from his musket (dragon) having on the muzzle of it the head of a dragon. At one time dragoons served both as mounted and foot soldiers, but now only as the former. In the British army there are heavy and light dragoons. The first dragoon regiment, the Scots Greys, was formed in 1681.

DRAGOON BIRD, same as umbrella bird.

DRAINAGE, a process by which wet and unhealthy soils are rendered arable and healthy.

Benefits of Drainage.—1. Removal of superfluous water. Not only is the standing water at the surface carried off, but the water-table is lowered, increasing the depth of soil.

2. Improves soil texture. Drained soils are more friable, less lumpy, offer less resistance to plant roots, and are of better texture in every way, than undrained soils.

3. Increases root pasturage. Agricultural literature is full of testimony to the benefits of deep tillage. The deeper the soil is stirred the greater its productiveness.

4. Increases soil fertility. It prevents loss of fertility by water passing over the surface. It adds to the fertility by sending summer showers down through the soil, instead of over them, enabling the crop to use the nitric acid and ammonia brought down. It increases the effect of manures by bringing them more quickly into solution and into more intimate contact with plant roots.

5. Makes tillage easier. Waste land is reduced, and the better texture of soil, its finer tilth and greater friability decrease draft and increase the effectiveness of tillage implements.

6. Lengthens the growing season for crops. Frost comes out earlier in the spring and the land becomes earlier warmed. Evaporation lowers temperature, but drainage removes water without evaporation.

7. Assists disintegration. Frosts penetrate deeper in winter in drained soils, assisting in unlocking the stores of mineral plant food.

8. Favors nitrification and bacterial action. Plants are largely dependent on the decomposition of organic matter in the soil for their supply of nitrogen. This change is brought about by the action of ferments or bacteria which thrive only under certain conditions of temperature and moisture. Drainage supplies the most favorable condition for their development.

9. Prevents heaving. The effect of stool-ice in throwing out young plants in winter is often to diminish seriously and even destroy the crop. Drainage dries up the surface soil and prevents the formation of stool-ice.

10. Lessens washing and diminishes violence of floods. By increasing the absorptive power of the soil less water is left to pass over the surface in a rainy season.

11. Improves the quantity and quality of crops. That the yield of crops is much greater on drained soils hardly needs to be substantiated. Rust, mildew, blight, etc., are much less prevalent in crops on drained soils.

12. Diminishes the effect of drought. By making the season earlier tillage can begin sooner and save moisture from wasting.

13. Healthfulness improved. So well known is this fact that large towns have undertaken the drainage of adjacent swamps to render the region more healthful.

Kinds of Drains.—Cobble-stone or so-called blind drains are undoubtedly the most ancient covered drains ever made. They are trenches partly filled with boulders picked up nearby and covered over with the earth thrown out.

Cobble duct. Two rows of boulders are laid in the bottom of the trench three or four inches apart, a third row is laid between on top, and these are covered with smaller stones and finally covered with the earth thrown out.

Brush drains are made by filling a trench with wide bottom full of brush laid in with stem ends downstream, treading them down, covering with sod, leaves or straw, and filling in. They are prone to cave in as the brush settles and decays, and are treacherous to animals.

French brush differ from common brush drains in having stakes driven X-wise in the bottom of the trench to raise the brush a few inches.

Box drains consist of two boards nailed together forming a V, laid in the bottom of trench with the apex up, and covered; or, of three boards, two set on edge three or four inches apart, with the third nailed across the top, placed in the trench open side down.

Plug drains are made by means of a plug, five or six feet long, consisting of four or five sections of wood with uniform elliptical cross sections, three or four inches in diameter, linked together by a short chain and bar for drawing the plug along the trench. Beginning at the upper end of the drain the plug is laid chain end downstream, in the bottom of the trench. A few inches of earth is tamped solidly over the plug; it is then drawn on by means of bar and chain, two-thirds of its length, and covered again, etc.

Mole drains are made with a mole plow, an implement constructed to draw an iron plug through the ground about three feet below the surface. This plow is usually drawn by a capstan with horses or oxen on the sweep.

Tile Drainage.—Drain tiles were in use at a very early date, probably during the Roman period. At first three bricks of common or special shape were used for the conduit, consisting of two set up edgewise a few inches apart, with a third across the top. Later a single brick was molded into the shape of the three as above laid. These were superseded by V-shaped tiles with broad soles on which to rest, and perforations along the back to admit the water. Plain cylindrical tiles are now generally used.

Outlets.—One of the weakest parts of a drain is the point of discharge. For this reason it is best not to have a separate outlet for each line of tiles, but rather to collect all into a system with a single outlet.

Minors or Laterals.—The smaller subsidiary lines are so called in distinction from the main drain, which follows the lower part of the field and receives the discharge from the smaller drains.

Before construction, a drainage system should be carefully studied, surveyed and mapped out, both for greater accuracy of work and for location of drains afterward. Steam-power ditchers have been perfected, which have demonstrated their practicability where land is free from obstructions and the grade fairly even.

DRAINAGE TUBES, in surgery, are an important addition to the surgical appliances for which this profession is indebted to a distinguished French surgeon, M. Chassaignac. They are composed of india-rubber, from one-eighth to three-eighths inch in diameter, perforated with numerous holes, and of various lengths. They are especially useful in chronic abscesses, but also in large wounds.

DRAKE, SIR FRANCIS, an English navigator, born in Tavistock, in Devonshire, England, in 1539, or according to some authorities in 1545. He served as a sailor in a coasting vessel, and afterward joined Sir John Hawkins in his last expedition against the Spaniards (1567), losing nearly all he possessed in that unfortunate enterprise. Having gathered a number of adventurers, he fitted out a vessel in which he made two successful cruises to the West Indies in 1570 and 1571. Next year, with two small ships, he again sailed for the Spanish Main, captured the cities of Nombre de Dios and Vera Cruz, and took a rich booty which he brought safely home. In 1577 Drake made another expedition to the Spanish Main, having this time command of five ships. On this the most famous of his voyages Drake passed the Straits of Magellan, plundered all along the coasts of Chile and Peru, sacked several ports, and captured a galleon laden with silver, gold, jewels, etc., to the value of perhaps $1,000,000.

He then ran N. as far as lat. 48° N., seeking a passage to the Atlantic, but was compelled to return to Port San Francisco on account of the cold. He then steered for the Moluccas, and hold-

ing straight across the Indian Ocean doubled the Cape of Good Hope, and arrived at Plymouth Nov. 3, 1580, being thus the first of the English circumnavigators. The queen showed her favor to Drake by knighting him on board his own ship. Five years afterward Drake was again attacking the Spaniards in the Cape Verde Islands and in the West Indies, and in 1588 particularly distinguished himself as vice-admiral in the conflict with the Spanish Armada. In 1593 he represented Plymouth in Parliament. His later expeditions, that in 1595 against the Spanish West Indies and that to Panama, were not so successful, and his death, on Jan. 28, 1596, at sea off Porto Bello, was hastened by disappointment.



SIR FRANCIS DRAKE

DRAKE, FRANKLIN JEREMIAH, an American naval officer, born at Yates, N. Y., in 1846. He graduated from the United States Naval Academy in 1868. He rose through the various grades, becoming lieutenant-commander in 1893, commander in 1899, and captain in 1903. In 1906 he was retired as rear-admiral. He served during the Civil War and filled many posts on shore and at sea as a commander of vessels and on special duty. He was executive officer of the Oregon in 1896-1897. From 1913 to 1915 he was technical expert at the Hague Tribunal, and was expert of the revision of regulations of the United States Navy in 1918-1919-1920.

DRAKE, JOSEPH RODMAN, an American poet; born in New York, Aug. 7, 1795. The poems for which he is gratefully remembered are "The Culprit Fay" (1819), and "The American Flag" (1819). With Fitz-Greene Halleck, under the signature, "The Croakers," he published in a New York journal in 1819 a series of short lyrics, mostly of a humorous kind, on the political affairs of the time. He died Sept. 21, 1820.

DRAKE, SAMUEL ADAMS, an American journalist and writer; born in Boston, Dec. 20, 1833. He entered journalism in 1858 as correspondent of the Louisville "Journal" and St. Louis "Republican." In 1861 he joined the army and served throughout the war, becoming Brigadier-General in 1863. He returned to Boston in 1871 and resumed literary work. His most important publications are: "Old Landmarks of Boston" (1872); "New England Legends" (1883); "The Making of New England" (1886); "The Pine Tree Coast" (1891); "Our Colonial Homes" (1894), etc. He died Dec. 4, 1905.

DRAKENBERGE (drä'ken-ber-ge) (Dragon Mountains), the general name given by the Dutch colonists to the range of mountains in the E. of south Africa, between Cape Colony and the Vaal river. From about 29° S. lat. the three chains which form the S. portion unite and extend N. E. in one mass, whose highest points are the Mont aux Sources and Catkin Peak (10,360 feet). The range is crossed by Van Reenen (5,415) and De Beers (5,635) passes.

DRAKE UNIVERSITY, a coeducational institution in Des Moines, Ia.; founded in 1891, under the auspices of the Christian Church; reported at the end of 1919: Professors and instructors, 60; students, 1,460; president, Arthur Holmes.

DRAMA (I act), a class of writings which almost entirely consist of dialogue, persons being represented as acting and speaking, and the pieces being usually intended to be acted on a stage by parties assuming the characters of the respective persons. Its two great branches are tragedy and comedy, the former, roughly speaking, melancholy in character, the latter cheerful. The origin of the drama must be sought for in the love of imitation, and dramatic performances of some kind are to be met with probably among all nations. Dramatic compositions are found in the

Old Testament, for example, in Job and the Song of Solomon; and ancient India and China both developed a dramatic literature of their own. The European drama had its origin in Greece. Both forms, tragic and comic, took their rise in the celebration of the Greek festivals of Dionysus (Bacchus), at which hymns and chants were sung by choruses in honor of the god, and the chorus continued to be a prominent feature of the old Greek drama. Greek comedy began about 580-560 B. C. with Susarion, but it was long in attaining regular form. Of the old Greek comedy the chief representatives were Cratinus, Eupolis, Pherecrates, and Aristophanes—the last the greatest.

The invention of tragedy is generally ascribed to Thespis about 530 B. C., who was followed by Phrynichus; but the true creator of tragedy was Æschylus, in whose works and those of Sophocles and Euripides it found its most perfect expression. Thespis had only one actor, who from time to time relieved the chorus by declamation. Æschylus changed this representation into real action by making use of two actors in addition to the chorus. Æschylus also introduced masks; and by means of a long gown and the cothurnus, or buskin, the lofty stature of the heroes was imitated. A third actor was first introduced by Sophocles. The regular drama among the Romans was borrowed from the Greeks. Plautus and Terence were imitators of the Greek comedy, Livius Andronicus (240 B. C.) of the Greek tragedy. Of the Roman tragedy, the dramas of Seneca are the only specimens extant.

In most modern European countries the regular drama took its rise in the mysteries, miracle-plays, and moralities of the Middle Ages. In Italy, however, it began with a reproduction in Latin of classical models. The earliest tragedy in Italian is Trissino's "Sofonisba" (1502). Regular comedies in Italian were written by Ariosto, Aretino, Machiavelli, and others; and to the same period (15th and 16th centuries) belongs the Italian Pastoral drama, which sprang from the ancient idylls, and aimed at a fanciful delineation of Arcadian and mythological scenes. Among the pastoral dramatists of this period are Poliziano, Tasso, and Guarini. The pastorals gave birth to the opera, early masters of which, so far as it may be included in the poetic drama, are Zeno and Metastasio. The Italian drama waned in the 17th century, but in the 18th genuine comedy and classic tragedy were restored, the former by Goldoni, the latter by Alfieri. Monti, Manzoni, Niccolini, Giacometti and D'Annunzio are among the later writers of tragedy.

The other European nations cultivated the dramatic art much later than the Italians. The English and Spaniards devoted their attention to it almost at the same time; the former reaching their acme in Shakespeare, the latter in Lope de Vega and Calderon. The history of the English theater and the drama is naturally divided into two parts, the first of which begins with the reign of Elizabeth and ends with the reign of Charles I. The rapid development of the drama during the reign of Elizabeth was entirely unhampered by foreign influence. Lyly, Peele, Greene, Marlowe, Shakespeare, Ben Jonson, Beaumont, and Fletcher, Chapman, Webster, Middleton, Marston, Ford, and Massinger are among the chief names connected with the brilliant period of the English drama. During the Commonwealth the Puritans prohibited all kinds of plays, and the theaters were shut up for 13 years. With Charles II. the drama reappeared, and exhibited a licentiousness hardly equaled by that of any other Christian nation. Among the chief names belonging to this period are Dryden, Otway, Lee, Shadwell, Wycherly and Etherege. From the close of the 17th to that of the 18th century British comedy was cultivated with much success by Cibber, Farquhar, Congreve, Sheridan, and others. During the 19th century many writers were conspicuous by their dramas. Among the chief of these may be noted Byron, Coleridge, Landor, Shelley, Maturin, Talfourd, Milman, Sir Henry Taylor, the first Lord Lytton, Knowles, R. H. Horne, Arnold, Browning, Swinburne, and Tennyson. Among other 19th century writers for the stage, who, however, may be called playwrights rather than dramatists, may be named Douglas Jerrold, Tom Taylor, Charles Reade, Thomas Robertson, W. G. Wills, Henry Byron, Robert Buchanan, Dion Boucicault, W. S. Gilbert, Stephen Phillips, Henry Arthur Jones, Arthur W. Pinero; and among Americans Bronson Howard, Augustus Thomas, William Gillette, Clyde Fitch, Edward Knoblock, Avary Hopwood, etc.

The French drama was in a miserable state before Corneille (1606-1684), who indeed is looked on as the founder of the drama in France. Racine, Molière, Voltaire, and in later times Hugo, are some of the other distinguished French dramatists. Since about 1820 a new dramatic school was formed in France, which, departing from the ancient strictness of what is called the classic, approaches more and more to the German or British,

or what is called the romantic school, the leader in the movement being Victor Hugo. C. Delavigne marks the transition from the classical to the beginnings of the romantic school, and among the modern dramatists may be mentioned A. de Vigny, George Sand, Alfred de Musset, Mérimée, Ponsard, Augier, Scribe, Dumas the Younger, Sardou, François Coppée, Jean Richepin, Edmond Rostand, Bernstein, Lernative, Mirbeau, and Becq.

The German drama is of later birth than any we have mentioned, and for a long time the Germans contented themselves with translations and adaptations from the French. Lessing was the first who, by word and deed, broke the French sway (1755), and he was succeeded by Schiller and Goethe, who rank as the greatest of the more modern dramatists. Prominent names in the German drama are Kotzebue, Körner, Schlegel, Tieck, Brentano, Grillparzer, Hebbel, Ludwig, Gutzkow, Freytag, Laube, Fulda, Hauptmann, Von Moser. The Dutch drama begins with the classical tragedies of Koster in the beginning of the 17th century, and reached its highest in Vondel (1587-1659). Holberg, Heiberg, Oehlenschläger, Ibsen, and Björnson are the chief names connected with the Scandinavian drama.

DRAMA LEAGUE OF AMERICA, an organization founded in 1910 at Evanston, Ill. The purpose of the League is to encourage the production of high-class drama by educating the public and by pledging the support of its members to plays approved by the organization. This latter takes the form of assuring the author support for the first ten days of the showing. The idea being that of giving the play a good introduction to the public. In addition to these steps the League issues a bulletin which it sends to all of its members, listing the good plays which are playing in their city and giving some idea of their general nature. The poor plays are not attacked, they are just ignored. The organization has had a rapid development and now has members in most of the cities in the United States.

DRAPER, ANDREW SLOAN, an American educator; born in Westford, N. Y., June 21, 1848. He served in the New York Legislature; was appointed by President Arthur one of the judges of the Court of Alabama Claims; was State Superintendent of Public Instruction in New York in 1866-1892, superintendent of schools in Cleveland, O., in 1892-1894; and in 1894 became president of the University of Illinois, which position he held for 10 years. In 1903 he was elected president of the National Central Association of Colleges and Secondary Schools. He was chosen Commissioner of Education of the State of New York in 1904. He was author of numerous educational works including "Conserving Childhood" (1909), and "Holiday Papers" (1912); Editor of "Self Culture for Young People" (10 vols.), 1906, etc. He died in 1913.

DRAPER, JOHN WILLIAM, an American physiologist, chemist, and writer; born near Liverpool, England, May 5, 1811. He came to the United States in 1833, and took his degree as M. D. at the University of Pennsylvania in 1836. He became Professor of Chemistry in the University of New York in 1841, and in 1850 Professor of Physiology. Among his works are: "Human Physiology" (1856); "History of the Intellectual Development of Europe" (1862), "History of the American Civil War" (1867-1870); "History of the Conflict between Religion and Science" (1875), which was translated into nearly all the languages of Europe. He died in Hastings-on-the-Hudson, N. Y., Jan. 4, 1882.

DRAVE, or **DRAU** (drä've), a European river which rises in Tyrol, flows E. S. E. across the N. of Illyria and the S. of Styria, and between Hungary on the left and Croatia and Slavonia on the right, and after a course of nearly 400 miles joins the Danube 14 miles E. of Essek. It is navigable for about 200 miles.

DRAVIDIAN, a term applied to the vernacular tongues of the great majority of the inhabitants of southern India, and to the people themselves who must have inhabited India previous to the advent of the Aryans. The Dravidian languages are generally considered to belong to the Turanian class, and the family consists of the Tamil, Telugu, Canarese, Malayâlam, Tulu, Tuda, Gond, Rajmahal, Oraon, etc. Only the first four mentioned have a literature, that of the Tamil being the oldest and the most important.

DRAWBRIDGE. See BRIDGE.

DRAWING, the art of representing upon a flat surface the forms of objects, and their positions and relations to each other. The idea of nearness or distance is given by the aid of perspective, foreshortening, and graduation. The term drawing, in its strict sense, is only applicable to the representing of the forms of objects in outline, with the shading necessary to develop roundness or modelling. In art, however, the term has

a wider significance. Highly finished paintings in water-color are called drawings, as are also sketches or studies in oils. Drawing, in its restricted sense, may be divided into these kinds: (1) pen drawing; (2) chalk drawing, which may include lead-pencil drawing; (3) crayon drawing; (4) drawing shaded with the brush or hair-pencil; (5) architectural or mechanical drawing.

Architectural and mechanical drawings are those in which the proportions of a building, or machine, are accurately set out for the guidance of the constructor; objects are in general delineated by geometric or orthographic projection. The great schools of painting differ from one another as much in their drawing as in their painting. In Italy the Roman school, through Raphael's fine sense for the beautiful and expressive in form, and through his study of the antique, became the true teacher of beautiful drawing. The Florentine school tried to surpass the Roman precisely in this particular, but it lost by exaggeration what it had gained by learning and a close study of anatomy. In the Lombard school a tender style of drawing is seen through harmonious coloring, and in the Venetian school the drawing is often veiled in the richness of the color. The Dutch school excels in a careful and minute style of naturalistic drawing, combined with great excellence in coloring. The French school in the time of Poussin was very accurate in its drawing; at a later period its style betrayed a great amount of mannerism. David introduced again a purer taste in drawing and a close study of the antique, and these are qualities which distinguished his school (the so-called classical school) from the romantic and eclectic schools of a later period. The drawing of the British school is naturalistic rather than academic. It has of late years much improved in accuracy and expressiveness.

DRAWING AND QUARTERING, the punishment for treason in Great Britain in force till 1870.

DRAYTON, MICHAEL, an English poet; born near Atherstone in Warwickshire in 1563. His most celebrated composition is "Polyolbion." He wrote also several dramas, among them "Sir John Oldcastle"; and "Poems Lyrick and Pastorall" (1605), including the celebrated "Ballad of Agincourt." He died Dec. 23, 1631.

DRAYTON, THOMAS FENWICK, an American military officer; born in South Carolina about 1807. He was graduated at the United States Military Academy in 1828, and resigned from the army in 1836. He entered the Confederate army upon the outbreak of the Civil War. He played a prominent part during the attack on Port Royal, commanding a force in Fort Walker which he was forced to evacuate. He died in Florence, S. C., Feb. 18, 1891.

DREAMS, subjective phenomena dependent on natural causes, or trains of ideas which present themselves to the mind during sleep. The principal feature of the state of dreaming is the absence of voluntary control over the current of thought, so that the principle of suggestion has unlimited sway. The utter want of coherency in the images that appear before the mental eye excites no surprise in the dreamer.

We dream because our brain is in a condition of partial activity. Some maintain that no sleep is ever so profound as to be perfectly dreamless. With an over-congested brain, there is a tendency to a rapid succession of vivid dreaming, interrupted by intervals of wakefulness. The brain cells are too excited by the excess of blood to pass into a condition of repose, and their activity tends to keep up the congestion of the organ. The onset of acute disease (especially when affecting the nervous system) is not infrequently heralded by continued dreaming or continued sleeplessness. Depressing dreams should always be regarded as an indication of need for attention to health, or to relaxation from work, more especially, perhaps, by those engaged in professional pursuits.

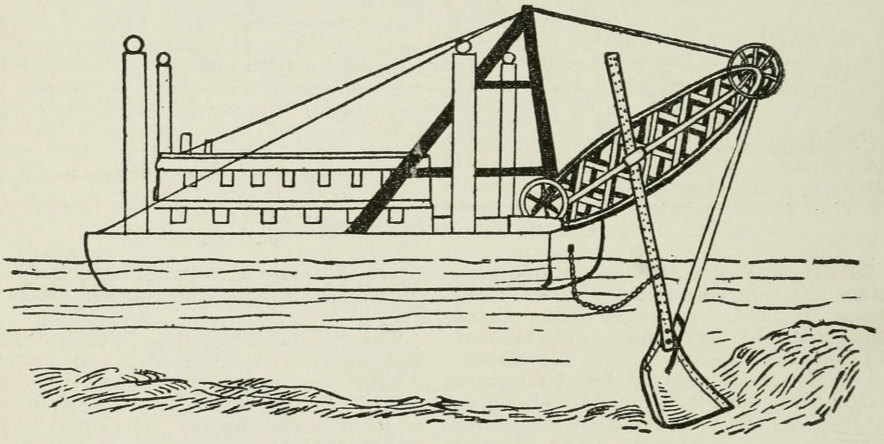
The special character of many dreams is determined by the conditions of the organs of the thorax and abdomen, and of the muscular system. For example, the presence of indigestible food in the stomach, by embarrassing the breathing and the action of the heart, suggests the ideas of the various forms of nightmare, the monster, or the crushing weight, from which there is no escape, which are closely akin to the sensations induced by similar effects on the heart during the day. An uncomfortable position in bed, a strained condition of the muscular system, will cause dreams of falling over precipices or of struggling. Certain drugs give a specific character to dreams. The magnificent visions of the opium stupor have been made familiar by the classical account of De Quincey. Excessive indulgence in alcohol gives rise to delirious dreams characterized by unfounded dread and suspicion. Occasionally intellectual efforts are made during sleep which it would be difficult to surpass in the waking state.

Among the peoples of antiquity, dreams were regarded as direct messages from the spiritual world, of either divine or diabolical origin; their interpretation was elevated to the rank of a science. At the royal courts of Babylon and Egypt the interpretation of dreams was part of the duties of soothsayers.

Pseudo-psychologists believed that dreams are caused by the flight of the soul to other regions, and that on its return to the body it remembered what it had actually seen. Some persons have thought dreams the proof of the soul's immortality. This hypothesis formed the basis of the religion of Comenius and of Emanuel Swedenborg. Swedenborg strengthened the Church which he founded by his claim to have visited Paradise and his report of his experiences there. The North American Indians regarded dreams as prophetic and often took them as solemn injunctions. Among more enlightened people there may be an inducement to action from the impression of a dream; here also, the consequence is the fulfilment of the prophecy. Such were the dreams of Judas Maccabæus, of Sulla, of Germanicus. It is said that the city of Carthage was rebuilt by Augustus Cæsar in consequence of the dream of his uncle Julius. Of such a nature, too, were the dreams of the Emperor Julian and of Calpurnia; and such was the dream of Cromwell that he should be the greatest man in England. In all these, and a thousand more, the mere constant thinking excited the dream. See FREUD, SIGMUND; PSYCHOANALYSIS.

DREBBEL (dreb'bel), **CORNELIUS**, a Dutch philosopher; born in Alkmaar, Netherlands, in 1572. He invented the thermometer which was named for him, and is sometimes erroneously said to be the discoverer of the telescope and microscope. He died in London in 1634.

DREDGING, the operation of removing mud, silt and other deposits from the bottom of harbors, canals, rivers, docks, etc., by mechanical means. The steam-dredging machine now in common use is said to have been first applied by Boulton and Watt for use on the Weir at Sunderland, England, in 1796. It has a succession of strong iron buckets on an endless chain running on a frame the lower end of which is vertically adjustable so as to regulate the depth at which it works. The buckets tear up the matter at the bottom, raise it, and discharge it into barges or hoppers stationed close to the dredging vessel. The

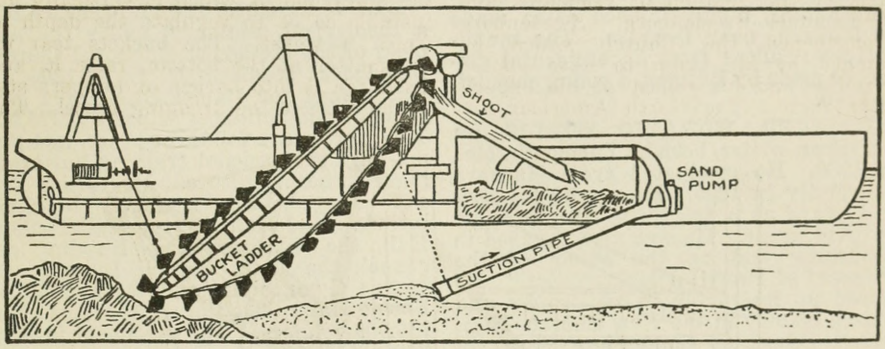


OSGOOD DIPPER DREDGE

Suez Canal was excavated by means of a ladder dredge with a long chute and supporting girder. The material excavated was carried in boxes on a sort of tramway and tipped out on the bank. The excavating buckets are sometimes placed on the perimeter of a large wheel instead of on an endless chain. The so-called clamshell bucket consists of two parts hinged together which descend through the water open and return closed with its clutch of material amounting sometimes to five cubic yards. In order to work in clay or hard sand it is provided with teeth. In some cases the current of river or tides has been utilized in dredging channels. In bottoms of mud or loose sand the steam pump or hydraulic dredger may be used. Great improvements have been made in hydraulic dredges, and some built in recent years for use in the Mississippi

river have a capacity of over 1,000 cubic yards per hour.

Dredging is also the operation of dragging the bottom of the sea in order to bring up oysters, or to procure shells, plants, and other objects for scientific observation. The oyster dredge is a light iron frame with a scraper like a narrow hoe on one side, and a suspending apparatus on the other. To the frame is attached a bag made of some kind of netting to receive the oysters. The dredges used by naturalists are mostly modifications of or somewhat similar to the oyster dredge.



BUCKET AND SUCTION DREDGE

DRED SCOTT CASE, a notable case before the Supreme Court of the United States in 1856. A negro called Dred Scott, with his wife and two children, had been held as slaves by a Mr. Emerson in Missouri. After Dr. Emerson's death, Scott and his family claimed to be free, as having resided with their owner in a free territory. The decision was hostile to their claim, and they were held to be still slaves.

DREISER, THEODORE, an American author and journalist; born in Terre Haute, Ind., 1871. After a common school education he began newspaper work in Chicago, in 1892. After 1898 he did special work for magazines. In 1905 he became editor of "Smith's Magazine," then, subsequently edited the "Broadway Magazine" (1906-1907). From 1907 till 1910 he was editor-in-chief of the Butterick publications. Among his best known books are: "Sister Carrie" (1900); "The Genius" (1915); "A Hoosier Holiday" (1916), and "The Hand of the Palter," a tragedy (1919).

DRESDEN (drez'den), the capital of Saxony, formerly a kingdom, but now a state in the German Republic; situated in a beautiful valley on both sides of the river Elbe. It is first mentioned in history in 1206, was greatly extended and embellished by Augustus the Strong (1694-1736), and rapidly increased during the 19th century. Among the chief edifices besides several of the churches are the museum containing a famous picture-gallery and other treasures; the Japanese Palace (Augusteum), containing the royal library of from 300,000 to 400,000 volumes, besides a rich collection of manuscripts; the Johanneum, containing the collection of porcelain and the historical museum, a valuable collection of arms, armor, domestic utensils, etc., belonging to the Middle Ages. The royal palace contains (in what is called the Green Vault) a valuable collection of curiosities, jewels, trinkets, and works of art.

The city is distinguished for its excellent educational, literary, and artistic institutions, among which are the Polytechnic School, much on the plan and scale of a university; the Conservatory and School of Music; the Academy of Fine Arts, etc. The manufactures are various in character; the china, however, for which the city is famed is made chiefly at Meissen, 14 miles distant. The commerce is considerable. The chief glory of Dresden is the gallery of pictures, one of the finest in the world, which first became of importance under Augustus II., King of Poland, and Elector of Saxony, but owes its most valuable treasures to Augustus III., who purchased the greater portion of the gallery of the Duke of Modena for $900,000. The pictures number about 25,000, and in particular comprise many fine specimens of the Italian, Dutch, and Flemish schools. Besides this fine collection the museum contains also engravings and drawings amounting to upward of 350-000. There is here also a rich collection of casts exemplifying the progress of sculpture from the earliest times, and including copies of all the most important antiques. It suffered severely in the

Thirty Years' War, and also in 1813, when it was the headquarters of Napoleon's army. It was occupied by the Prussians in 1866, but was evacuated in the following spring. Pop. about 550,000.

DRESDEN, BATTLE OF, a battle fought in 1813 between the French under Napoleon and the allies under Schwarzenberg. Napoleon had come to the relief of the city, which was occupied by the French. The allies assaulted and bombarded the city, and soon after a great pitched battle was fought (Aug. 27), in which the allies were defeated.

DRESDEN CHINA, a delicate, semi-transparent, highly-finished china made at Meissen, near Dresden. The manufacture resulted from an accidental discovery made by Böttger, a young chemist, in 1710.

DRESSER, HORATIO WILLIS, an American writer, born at Yarmouth, Me., in 1866. He graduated from Harvard University in 1895. He served for several years as a telegraph operator and railroad agent. He was also engaged in publishing and as the editor of the "Journal of Practical Metaphysics." He served as instructor in philosophy and church history in the New Church Theological School of Cambridge, Mass., in 1913-1914, and from 1893 to 1912 was a lecturer on practical philosophy. He wrote many books on this subject, including "The Power of Silence" (1895); "Voices of Hope" (1898); "Handbook of the New Thought" (1917); "The Victorious Faith" (1917). He also edited several works on the New Thought Movement.

DREW, DANIEL, an American capitalist; born in Carmel, N. Y., in 1788. He was the founder of the Drew Ladies' Seminary at Carmel, and the Drew Theological Seminary at Madison, N. J. He also gave large sums of money to various Methodist colleges and schools. He died in New York City, Sept. 19, 1879.

DREW, JOHN, an American comedian; born in Dublin, Ireland, Sept. 3, 1825. He made his first appearance at the Bowery Theater, New York, in 1845, and later became manager, in connection with William Wheatley, of the Arch Street Theater in Philadelphia. He acted in the principal cities of the United States and also in England and Australia. He died in Philadelphia, Pa., May 21, 1862. His wife, LOUISA DREW, born in London, England, Jan. 10, 1820, for a whole generation stood at the head of comedy actresses. Her greatest success was as Mrs. Malaprop in "The Rivals." After her husband's death Mrs. Drew managed the Arch Street Theater for a number of years. She died in Larchmont, N. Y., Aug. 31, 1897. Their son, JOHN DREW, born in Philadelphia, Nov. 13, 1853, first appeared at his father's theater in that city, and for a short season played there with Edwin Booth. He visited Europe in 1892 with Daly's company. He began his starring tours in the autumn of 1892, playing in "The Masked Ball." In 1901, he reduplicated some of his earlier successes in "The Second in Command." He has since toured the country in comedies by French and English dramatists with continued success.

DREW THEOLOGICAL SEMINARY, a theological seminary, under the auspices of the Methodist Episcopal Church, founded at Madison, N. J., in 1866. It was named for Daniel Drew, who gave grounds and buildings valued at $275,000. The courses are for three years, and give not only professional training but training in liberal culture. No tuition fees are charged. The seminary buildings include Mead Hall, Asbury Hall, Embury Hall, the Administration Building and chapel, the J. B. Cornell Library, the Bowne Gymnasium, and the Samuel W. Bowne Hall. The library contains about 130,000 volumes. The enrolment is about 200.

DREXEL, ANTHONY JOSEPH, an American banker; born in Philadelphia, Pa., in 1826. He became the head of the well-known firm of Drexel & Co., Philadelphia, having been identified with it from the age of 13. He was zealous in promoting science and art, especially music, and contributed largely to philanthropic and educational interests. The Drexel Institute of Art, Science and Industry, Philadelphia, dedicated Dec. 18, 1891, was established by him. His name is associated with that of his friend, George W. Childs, in the inception of the Childs-Drexel Home for Union Printers, Colorado Springs, Col. He died in 1893.

DREXEL INSTITUTE OF ART, SCIENCE AND INDUSTRY, an institution founded in 1891 in Philadelphia, by Anthony J. Drexel. Its purpose is to instruct men in engineering; women in the domestic arts and science; and both men and women in clerical and secretarial work. The Institute includes the Engineering School, the School of Domestic Science and Art, and the Secretarial School. Special courses are also offered in chemistry, architecture, and English. In 1919 there were 499 students and 51 members of the faculty. President, Hollis Godfrey, Sc. D., F. R. G. S.

DREYFUS, ALFRED, a French military officer; born in Alsace in 1859. He

entered the Polytechnic School in Paris in 1878 and four years later was made a lieutenant of artillery. In 1889 he became a captain. He was arrested in 1894 charged with selling military secrets to Germany and Italy. He was convicted and on Jan. 5, 1895, publicly degraded from his rank in the presence of 5,000 troops. His sentence included life imprisonment on the Isle du Diable, off the coast of French Guiana, where he was rigidly confined till 1899 when the French Senate voted for revision of the Dreyfus



ALFRED DREYFUS

case. He was accordingly brought back to France, retried by court-martial and again convicted. The French Government granted him a pardon almost immediately. He published "Five Years of My Life" (1901). Dreyfus was restored to the army, and served during the World War.

DREYSE, JOHANN NIKOLAUS VON (dri'ze), a German inventor; born in Sömmerda, near Erfurt, in Prussia, in 1787. He worked as a locksmith in Germany, and in a musket factory in Paris from 1809 to 1814. He then founded an ironware factory in Sömmerda, and began the manufacture of percussion-caps under a patent in 1824. In 1827 he invented a muzzle-loading, and in 1836 a breech-loading needle-gun, which was adopted in the Prussian army in 1840. In 1864 Dreyse was ennobled. He died Dec. 9, 1867.

DRIFT, a word of several applications.

1. Architecture: The push, shoot, or horizontal thrust of an arch or vault on the abutments.

2. Geology: A loose aggregation or accumulation of transported matter, consisting of sand and clay, with a mixture of angular and rounded fragments of rock, some of large size having occasionally one or more of their sides flattened or smoothed, or even highly polished. The smoothed surfaces usually exhibit many scratches parallel to each other, one set often crossing an older one. The drift is generally unstratified, in which case it is called till. This may be in places 50 or even 100 feet thick.

3. Ordnance: A priming-iron to clean the vent of a piece of ordnance from burning particles after each discharge.

4. Machinery: A round piece of steel, made slightly tapering and used for enlarging a hole in a metallic plate by being driven through it. The drift may have a cutting edge merely on its advance face, or it may have spirally cut grooves which give the sides of the drift a capacity for cutting.

DRIFT PERIOD, the period during which the drift described above was deposited. Though there is no reason why it should not have recurred time after time during bygone geological ages, yet the term "drift-period" as a measure of duration is limited to the time commencing during the Newer Pliocene or Pleistocene, and terminating with the Post Pliocene or Post Pleistocene, during which drift was deposited in the latitudes in which we find it now. That it is essentially a glacial phenomenon is apparent from the fact that while becoming more marked in its character on this side the equator, the farther N. one goes, it dies out about lat. 50° N. in Europe and 40° in North America. Hence it is often called Northern Drift. A corresponding development of it, however, exists in the S. hemisphere. This becomes more marked as one approaches the S. pole, and disappears, between 40° and 50° S. lat. Where it exists nearer the equator it is deposited around some giant mountain, the scratches and striations on the boulders and pebbles radiating from the mountain on every side. The drift is now universally attributed, as Agassiz long ago suggested, to the action of ice, the only controversy remaining being whether land ice or floating icebergs took the chief part in its distribution. Hence it is often called, as by Sir Charles Lyell, Glacial Drift.

DRILL, a metallic tool for boring a hole in metal or hard material such as stone. Its form varies with the material in which it works. The action in metal is usually rotative, and the tool has two or

more cutting edges. In stone drills the action is rotative or reciprocating; in the latter case the tool is alternately lifted and dropped.

In agriculture, a machine for sowing grain in rows; in fabrics, a heavy cotton twilled goods, used especially for lining; drilling: in military and naval language, the act or process of training soldiers or sailors to military or naval warfare, as in the manual of arms, the execution of evolutions, etc.

DRIMYS, a genus of plants belonging to the order *Magnoliacæ*. They are distinguished by their bitter, tonic, and aromatic qualities. *D. winteri*, or *aromatica*, carried to Europe by Captain Winter from the Straits of Magellan in 1579, yields Winter's bark, which has been employed medically as an aromatic stimulant. It somewhat resembles canella bark. The bark of *D. granatensis* is used in Brazil against the colic. It is tonic, aromatic, and stimulant. That of *D. axillaris*, a native of New Zealand, has similar qualities.

DRINKER, HENRY STURGIS, an American educator, born in Hong Kong, China, in 1850. He graduated from Lehigh University in 1871. For several years he was engaged in the practice of engineering. He then studied law and was admitted to the bar in 1878. From 1885 to 1905 he was general solicitor of the Lehigh Valley Railroad. In the latter year he was chosen president of the Lehigh University. He was the author of "Tunneling, Explosive Compounds and Rock Drills" (1878), and was the author of several works on law relating to railroads. From 1913 to 1916 he was president of the National Reserve Corps, and from 1916 to 1919 he was chairman of the board of Military Training Camps Association.

DRINKWATER, JOHN, an English poet and critic, born in 1882. He was educated in the Oxford High School and spent 12 years in business. He was one of the founders of The Pilgrim Players and for several years managed that company at the Birmingham Repertory Theater. He wrote many plays, some of which were extremely successful. These included: "Rebellion" (1914); "Swords and Ploughshares" (1915); "Abraham Lincoln" (1919). The latter play was very successful both in England and in the United States. In addition to his plays he wrote several books on biography and contributed verse and prose to periodicals.

DRIP STONE, corona or projecting tablet or molding over the heads of doorways, windows, archways, niches, etc. Called also a label, weather-molding, water-table, and hood-molding. The term label is usually applied to a straight molding.

DRISHEEN CITY, Cork, Ireland. The name arises from a favorite dish, native to the place, composed of cows' milk and the blood serum of sheep in equal quantities, flavored with pepper, salt, and tansy, served hot, and eaten at breakfast.

DROGHEDA (droch'e-dä), a seaport town, and county of itself, in the S. E. of County Louth, Ireland, built mostly on the N. bank of the river Boyne, 4 miles from its mouth, 32 N. of Dublin by rail, and 81 S. of Belfast. The Boyne is crossed here by a railway viaduct 95 feet high. In 1649 Cromwell stormed the town after a desperate struggle, and for a stern lesson to the Irish, put its stubborn garrison to the sword. Poyning's laws were enacted here in 1494, and about the same time a mint was set up. Drogheda surrendered to William III. the day after the battle of the Boyne. Pop. about 13,000.

DROME, S. E. department of France, covered almost throughout by ramifications of the Alps, the average height of which, however, does not exceed 4,000 feet; area, 2,518 square miles, of which about one-fourth is waste, one-third under wood, and a great part of the remainder under tillage and pasture. A considerable extent of the area is occupied by vineyards, and several of the wines produced have a high reputation, especially Hermitage. Olives, chestnuts, and silks are staple productions. Valence is the capital. Pop. about 290,000.

DROMEDARY, a swift variety of the one-humped camel, bearing the same relation to it as race horse to cart horse. Its usual pace is a trot, which can be maintained often at the rate of nine miles an hour for many hours on a stretch. After running for 24 hours, when in good condition, the dromedary is refreshed with a frugal meal of barley and powdered dates, along with a little water or camel's milk, and is then ready for another day of it. Though now distinctive of north Africa, the dromedary seems to have been unknown to the ancient Egyptians.

DRONE. See BEE.

DROUTHEIM. See TRONDHJEM.

DROPSY, a class of diseases always of serious import, though not often, perhaps, directly fatal. Dropsy is rather a symptom than a disease; it consists of the effusion of watery fluid from the blood into the skin and subjacent tex

tures, or into the cavities of the body. When the effusion is chiefly in the superficial parts, the dropsy is called anasarca (*ana*, upon, *sarx*, the flesh); when it is in the abdomen, it is termed ascites; when in the space around the lungs, hydrothorax. Dropsy most commonly depends on disease of the heart or kidneys; in cases of ascites, the liver and spleen are often at fault. The treatment of dropsy is chiefly by diuretics and other evacuant remedies, which remove the fluid from the textures by unloading the blood of its excess of serum. Mechanical means are also frequently used to relieve the patient of the fluid—in the case of the cavities of the body, tapping; in the cellular tissue either free incisions, or small tubes inserted through the skin.

DROP-WORT (from the small tubers on the fibrous roots), *Spiræ filipendŭla*, natural order *Rosaceæ*, a British plant of the same genus as queen-of-the-meadow, found in dry pastures. The hemlock drop-wort, or water drop-wort, is *Œnanthe fistulōsa*.

DROSERACEÆ, sundews, an order of hypogynous exogens, alliance *Berberales*. It consists of delicate herbaceous plants, often covered with glands. Found all over the world.

DROSKY, DROSHKY, or **DROSCHKE**, a Russian and Prussian four-wheeled vehicle in which the passengers ride astride a bench, their feet resting on bars near the ground. It has no top.

DROSOMETER, an instrument for ascertaining the quantity of dew which falls. It consists of a balance, one end of which is furnished with a plate fitted to receive the dew, the other containing a weight protected from it.

DROWN, THOMAS MESSINGER, an American scientist; born in Philadelphia, March 19, 1842. He was graduated at the University of Pennsylvania in 1862, studying later at Yale, Harvard, and Heidelberg. He was Professor of Chemistry at Lafayette College, 1874-81; Massachusetts Institute of Technology, 1885-95; was president of Lehigh University, 1895-1904. He died Nov. 16, 1904.

DROWNING, death by suffocation, owing to the mouth and nostrils being immersed in a liquid. Complete insensibility arises in from one to two minutes after submersion, recovery being still possible; death occurs in from two to five minutes. As long as the heart continues to beat, recovery is possible; after it has ceased, it is impossible. Newly born children and young puppies stand submersion longer than the more fully grown. Various methods have been devised for the restoration of the apparently drowned. That of Dr. Sylvester, recommended by the English Humane Society, produces deeper inspiration than any other known method. That known as the "direct method," introduced by Dr. Benjamin Howard, of New York, effects the most complete expiration.

These instructions will be found useful when no assistance can be had:

Arouse the Patient.—Do not move the patient unless in danger of freezing; instantly expose the face to the air, toward the wind if there be any; wipe dry the mouth and nostrils; rip the clothing so as to expose the chest and waist; give two or three quick, smarting slaps on the chest with the open hand.

If the patient does not revive, proceed immediately as follows:

To Expel Water from the Stomach and Chest.—Separate the jaws and keep them apart by placing between the teeth a cork or small bit of wood; turn the patient on his face, a large bundle of tightly rolled clothing being placed beneath the stomach; press heavily on the back over it for half a minute, or as long as fluids flow freely from the mouth.

To Produce Respiration.—If no assistance is at hand and one person must work alone, place the patient on his back with the shoulders slightly raised on a folded article of clothing; draw forward the tongue and keep it projecting just beyond the lips; if the lower jaw be lifted the teeth may be made to hold the tongue in place; it may be necessary to retain the tongue by passing a handkerchief under the chin and tying it over the head.

Grasp the arms just below the elbows and draw them steadily upward by the sides of the patient's head to the ground, the hands nearly meeting.

Next lower the arms to the side and press firmly downward and inward on the sides and front of the chest over the lower ribs, drawing toward the patient's head.

Repeat these movements 12 to 15 times every minute, etc.

DROZ (drō), **FRANÇOIS XAVIER JOSEPH**, a French moralist and historian; born in Besançon in 1773. In 1806 he published "An Essay on the Art of Being Happy," which was very popular; and in 1823 "Moral Philosophy, or Different Systems of the Science of Life," which procured his admission into the Academy. His reputation is, however, founded chiefly on his "Histoire du règne de Louis XVI." He died in 1850.

DRUG, a name applied to all articles used for medicinal purposes, though the term should, perhaps, be strictly confined

to what are called simples, balsams, gums, resins, and exotic products used as medicaments in a dry state.

DRUG ADDICTION. Drugs resulting in formation of habits are numerous, but the main ones are usually morphine and other products of opium, cocaine, and alcohol. The latter is rarely included under this head. The practice of injecting drugs did not come into use in Europe until after the invention of the hypodermic needle in 1845. After that time it spread through Europe and America with great rapidity until it was estimated in 1893, there were 100,000 cases of morphinomaniacs in Paris alone. Its use in the United States was widespread largely because of the increasing Chinese population and the ease with which opium was imported. The cocaine habit is of more recent growth, but when it started, hardly forty years ago, its progress was amazingly rapid. For a time it was spread by its excessive use in patent medicines, and doctors' prescriptions. Caffeine, a drug which in its effects resembles closely cocaine, is present in tea and coffee and makes their excessive use harmful to the nervous system. The effect of the use of tobacco is a more disputed point, but there seems to be agreement that its use tends to promote hardening of the arteries and increased blood pressure. Drugs, such as chloral and veronal, are used to induce sleep and are almost equally injurious as morphine in their effects upon the nervous system. Acetanilid and antipyrin are drugs used in the preparation of many patented headache relievers and their continued use is certain to produce anæmia and weakness of the heart.

Attempts to remedy this spread of the use of drugs have been earnest and in some measure effective. Most important of all has been the outlawry of the opium trade by an agreement between nearly all the civilized nations of the world. In the United States a federal law placing a prohibitive tax upon all narcotics imported into the United States, over and above that which is needed for medical purposes, has been passed. Many State laws, some, especially that of New York, very stringent in their provisions, have been enacted. Drug stores are compelled to make affidavit to the amount of narcotics in their possession and to issue them only upon doctors' prescriptions. The latter are also carefully watched in this particular and any widespread and continuous prescriptions of morphine may lead to a revocation of the doctor's license to practice. Nothwithstanding these measures, Dr. Copeland, Health Commissioner of New York, estimated that in the winter of 1918-1919, there were in the City of New York not less than 60,000 persons addicted in a serious way to the use of drugs. The United States was still importing 500,000 pounds of opium legally and illegally, which was ten times as much in proportion as that imported by other countries. The business of securing and distributing opium and its progress is found almost entirely among people who are criminals in other respects, as it is found that drugs lead to crime much more frequently than crimes to drugs. The United States Health Service in 1919 reported an increase in the use of narcotics in twenty States.

DRUGGET, a coarse and flimsy woolen texture, chiefly used for covering carpets. It was formerly extensively employed as an article of clothing by the poorer classes, more especially of females.

DRUIDS, the priests of the Celts of Gaul and Britain. According to Julius Cæsar, they possessed the greatest authority among the Celtic nations. They had some knowledge of geometry, natural philosophy, etc., superintended the affairs of religion and morality, and performed the office of judges. They venerated the mistletoe when growing on the oak, a tree which they likewise esteemed sacred. They had a common superior, who was elected by a majority of votes from their own number, and who enjoyed his dignity for life. Of their religious doctrines little is known. Human sacrifice was one of their characteristic rites, the victims being usually prisoners of war.

DRUID STONES, a name given in the S. of England and other parts of the country to those weather-worn, rough pillars of gray sandstone which are scattered over the surface of the chalk-downs in England, in Scotland, and its islands, and which exist in great numbers in others countries; generally in the form of circles, or in detached pillars.

DRUM, a musical instrument formed by stretching parchment over the heads of a cylinder of wood or over a bowl-shaped metallic vessel. The skin of the ass is a very superior article for the purpose. There are three kinds of drums: (1) The long drum or bass drum with two heads, held laterally and played on both ends with stuffed-knob drumsticks. (2) The side-drum, having two heads, the upper one only being played on by two sticks of wood; the lower head has occasionally strings of catgut stretched across its surface, and then it is called a snare drum. (3) The kettle-drum always employed in pairs. Of these (1)

is the ordinary drum used by an infantry or marching band. It is employed mainly to mark the time, and also to increase the fortes. The big drum, or grosse caisse, of the modern orchestra, is a modification of the ordinary drum, with the diameter greatly increased, and the length of the cylinder lessened. It is struck on one side only. (2) Is the side-drum of the fife and drum bands. It is occasionally employed in the orchestra for special effects. (3) Are either the small kettle-drums of the cavalry band, played on horseback; or the proper orchestral drums, larger in size, but similar in construction.

The tambourine is a species of drum, consisting of a single skin on a frame or vessel open at bottom. The heads are tightened by cords and braces, or by rods and screws.

The drum was a martial instrument among the ancient Egyptians, as the sculptures of Thebes testify. Their long drum was like the Indian tam-tam, and was beaten by the hand. The invention of the drum is ascribed to Bacchus, who, according to Polygœnus, gave his signal of battle by cymbal and drum.

DRUMFISH, or **DRUM**, *Pogonias chromis*, and other species of the same genus, fishes found on the Atlantic coasts of North America, and so named from the deep, drumming sound they make in the water. They usually weigh about 20 pounds.

DRUMMOND, SIR GEORGE GORDON, an English soldier; born in 1771. He entered the British army as ensign in 1789; became lieutenant-colonel, 1794; served with distinction in the Holland campaign, 1794-1795, and in Egypt, 1800; was staff-officer at Jamaica several years; on duty in Canada, 1808-1811; promoted lieutenant-general, 1811; again ordered to Canada as second in command under Sir George Prevost, 1813; planned and effected the capture of Fort Niagara, and planned the successful attack on Black Rock and Buffalo; led a combined military and naval force against Oswego and destroyed the American works and stores, May, 1814; was in command of the British forces at the battle of Lundy's Lane, July 25, and in August invested, but failed to capture, Fort Erie. In 1815 he was appointed Governor-General of Canada, resigned and returned to England, and in 1817 received the grand cross of the Order of the Bath. He died in 1854.

DRUMMOND, HENRY, a Scotch geologist and religious writer; born in Stirling in 1851. He studied theology at Edinburgh University. In 1877 he was appointed Professor of Natural Science in the Free Church College, Glasgow. "Natural Law in the Spiritual World" (1883), and its successor "The Ascent of Man," applications of modern scientific methods to the immaterial universe, made his popular fame. He traveled in central Africa (1883-1884) studying its botany and geology, and later wrote "Tropical Africa" (1888). Other semi-religious writings of his are: "Pax Vobiscum" (1890); "The Greatest Thing in the World" (1890); "The Programme of Christianity" (1892). He died in Tunbridge Wells, England, March 11, 1897.

DRUMMOND, THOMAS, a Scotch scientist; born in Edinburgh in 1797. During his professional training at Woolwich and Chatham he showed high mathematical and mechanical abilities, with aptitude for the practical application of scientific principles. In 1920 he was an assistant in the trigonometrical survey of the United Kingdom. The incandescence of lime having been brought under his notice at a lecture on chemistry, he made experiments, and the result was the Drummond Light, noticed in the "Philosophical Transactions" (1826). He invented a heliostat or reflecting mirror, described in the same paper. Experiments for adapting his light to lighthouses are detailed in the "Philosophical Transactions" (1830). In 1835 he went to Dublin with Lord Mulgrave as under-secretary for Ireland. He died in Dublin, April 15, 1840.

DRUMMOND, WILLIAM, a Scotch poet; born in Edinburgh, Dec. 13, 1585. He was educated at the University of Edinburgh, after which he spent four years in foreign travels. On his return to Scotland he retired to Hawthornden. He entertained Ben Jonson, on the occasion of a visit which the English dramatist made to Scotland in the winter of 1618-1619, and took notes of Jonson's conversation, which were first published in 1711. He was the first Scotch writer to abandon the native dialect for the language raised to supremacy by the Elizabethan writers. His chief productions are: "The Cypress Grove," in prose, containing reflections upon death; "Flowers of Zion, or Spiritual Poems"; "Tears on the Death of Mœliades"; "Poems, Amorous, Funeral, Divine, Pastoral, in Sonnets, Songs, Sextains, Madrigals"; "The River Forth Feasting" and "History of the Lives and Reigns of the Five Jameses, Kings of Scotland." He died in Edinburgh, Dec. 4, 1649.

DRUMMOND ISLAND, the extreme W. of the Manitoulin chain, in Lake Huron, belongs to Chippewa co., Mich. It measures 20 by 10 miles.

DRUPE, fruit composed of a single monospermous carpel, and of which the carpellary leaf becomes fleshy at its external division, and ligneous in its internal division, as in the peach, cherry, plum, etc. The stone which incloses the kernel is the endocarp; the pulpy, or succulent part, the mesocarp.

DRURY'S BLUFF, an eminence on the James river, near Fort Darling, 8 miles S. of Richmond, Va. It was the scene of a battle, May 16, 1864, in which the Confederates under Beauregard defeated the Union troops under Butler, with a loss to the Confederates of 2,500 and to the Union army of 3,012.

DRUSE, DRUZE, DERUZ, or DOROUZ, a politico-religious sect of Mohammedan origin, but deemed by orthodox Moslems heretical. El-Hakim Biamr-Allah, the sixth Fatimite Caliph of Egypt, a cruel and fanatical man, who lived in the 11th century, proclaimed himself an incarnation of God, and established a secret society. When walking in the vicinity of Cairo, his capital, he disappeared from his subjects' view, the most natural explanation being that he was assassinated and his body hidden somewhere. His followers believed in his return to this earth to reign over it, and propagated their faith in the adjacent lands. Two of the most notable missionaries were the Persian messengers, Hamzah and Mohammed ben Ismail ed Derazi. The latter proclaimed the Druse tenets with such zeal in Lebanon that the converts to belief in El-Hakim were called not Hakimites but Druses. The Druses believe in the unity of God, who they think was manifest in the person of several individuals, the last of them Hakim. They believe in the constant existence of five superior spiritual ministers, the greatest of them being Hamzah and Jesus, and hold the transmigration of souls. They are divided into the 'Okkal or Initiated, and the Juhhâl, or Ignorant. Their day of worship is Thursday. Ethnologically they are Arabs who came from the E. parts of Syria and settled in Lebanon and Antilebanon in the 11th century. Their territory on the Lebanon is S. of the Maronites. They extend thence to the Hauran and to Damascus. In 1860 they attacked the Maronites, about 12,000 of whom they cruelly massacred, not sparing even women or male children in their fury. The arrival of Turkish and French troops, in August and September, 1860, and the execution of 167 Druses, restored at least the semblance of tranquillity.

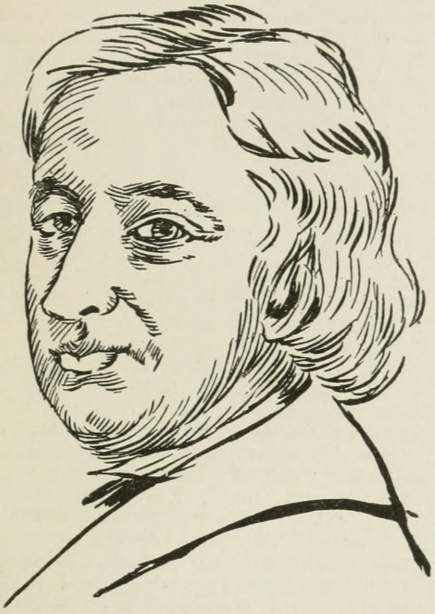
DRUSUS, the name of several distinguished Romans, among whom were: MARCUS LIVIUS, orator and politician; became tribune of the people in 122 B. C. He opposed the policy of Caius Gracchus, and became popular by planting colonies. MARCUS LIVIUS, son of the above, was early a strong champion of the senate or artistocratic party, but showed great skill in manipulating the mob. He rose to be tribune of the people, and was assassinated 91 B. C. NERO CLAUDIUS, brother of the Emperor Tiberius, born 38 B. C. By a series of brilliant campaigns he extended the Roman empire to the German Ocean and the river Elbe, and was hence called Germanicus. By his wife Antonia, daughter of Mark Antony, he had a daughter, Livia, and two sons, Germanicus and Claudius, the latter of whom afterward became emperor. He died in 9 B. C.

DRYAS, a famous Spartan, slain by Diana in the Theban war.

DRYDEN, JOHN, an English poet; descended from an ancient family, his grandfather being Sir Erasmus Dryden of Canons Ashby, Northamptonshire; he was born near Aldwinkle, Northamptonshire, in 1631, and was admitted a king's scholar at Westminster, whence he went to Trinity College, Cambridge, being here elected to a scholarship. After leaving the university he went to London, where he acted as secretary to his cousin, Sir Gilbert Pickering, a favorite of Cromwell; and on the death of the Protector he wrote his heroic stanzas on that event. At the Restoration, however, he hailed the return of Charles II. in "Astræa Redux," and from that time his devotion to the Stuarts knew no decay. In 1661 he produced his first play. "The Duke of Guise"; but the first that was performed was "The Wild Gallant," which appeared in 1663 and was not a success. This was followed by "The Rival Ladies," and "The Indian Queen," a tragedy on Montezuma in heroic verse, written in collaboration with Sir Robert Howard, whose sister, Lady Elizabeth Howard, Dryden married in 1663. He followed up "The Indian Queen" with "The Indian Emperor," which at once raised Dryden to the highest pitch of public estimation.

The great fire of London put a stop for some time to theatrical exhibitions. In the interval Dryden published the "Annus Mirabilis," a historical account of the events of the year 1666. In 1668 he also published his celebrated "Essay on Dramatic Poesy"—the first attempt to regulate dramatic writing. In 1668 the "Maiden Queen," a tragi-comedy, was represented. This was followed in 1670 by the "Tempest," an alteration from Shakespeare, in which he was as-

sisted by Sir William Davenant. It was received with general applause. Dryden was shortly afterward appointed to the offices of royal historiographer and poet-laureate, with a salary of $1,000 a year. He now became professionally a writer for the stage, and produced many pieces, some of which have been strongly censured for their licentiousness and want of good taste. The first of his political and poetical satires, "Absalon and Achitophel" (Monmouth and Shaftesbury), was produced in 1681, and was followed by "The Medal," a satire against sedition; and "Mac Flecknoe," a satire on the poet Shadwell. On the accession of James in 1685 Dryden became a Roman Catholic. He defended his new religion at the expense of the old one in a poem, "The Hind and the Panther." Among his other services to the new king were a savage reply to an attack by Stillingfleet, and panegyrics on Charles and James under the title of "Britannia Rediviva."



JOHN DRYDEN

At the Revolution Dryden was deprived of the offices of poet-laureate and historiographer. During the remaining 10 years of his life he produced some of his best work, including his admirable translations from the classics. He published, in conjunction with Congreve, Creech, and others, a translation of Juvenal, and one of Persius entirely by himself. His poetic translation of Vergil appeared in 1697, and, soon after, that masterpiece of lyric poetry, "Alexander's Feast," "His Fables," etc. His poetry as a whole is more remarkable for vigor and energy than beauty, but he did much to improve English verse. He was also an admirable prose writer. He died May 1, 1700, and was buried in Westminster Abbey.

DUBLIN, a city of Georgia, the county-seat of Laurens co. It is on the Macon, Dublin and Savannah, the Central of Georgia, and the Wrightsville and Tennille railroads, and on the Oconee river. There are cotton and oil mills, fertilizer works, and manufactures of hardwood products, cigars, etc. Pop. (1910) 5,795; (1920) 7,707.

DUBLIN (Irish *Dubh-linn*, black pool), the capital of Ireland; on the river Liffey, where it disembogues into Dublin Bay. Much of the city is built on land reclaimed from the sea, and the ground is generally flat, with a very few undulations, scarcely deserving the name of hill. The river, running from E. to W., divides the city into two almost equal portions. The aristocratic parts are the S. E. and N. E., containing many beautiful squares, with splendid streets and terraces. The center and the N. W. quarter are the great emporiums of trade and the residence of the middle classes, many of whom, however, have their private houses in the suburbs. The S. W. division, part of which is called the "Liberties," was once the seat of the silk trade. The streets in this quarter are narrow, crooked, and irregular, while in the fashionable quarter they possess a totally opposite character. The city is surrounded by a "Circular Road," of nearly 9 miles in length, forming a favorite drive and promenade. Dublin was the center of the fighting during the Irish rebellion on Easter Monday, 1916, when the postoffice and other public buildings as well as many business houses were wrecked. Pop. (1919) 399,000.

DUBLIN, UNIVERSITY OF, an institute for higher learning, in Dublin, Ireland, better known as Trinity College. It received a charter from Queen Elizabeth in 1591, and the ground upon which it was built was donated by the Corporation of Dublin. The first chancellor was William Cecil, Lord Burghley. There were in 1919 1,350 students and 88 instructors.

DUBNO, FORTRESS OF, one of a triangle of three strongholds built by the Russians in Galicia (the other two being Lutsk and Rovno) and which were the object of heavy fighting during the operations on the eastern front during the World War. These fortifications en-

abled the Russians to maintain their lines of communication with the interior and made possible the transfer of forces through the protection they gave to the various railroad lines necessary for such a transfer. The fortress was captured and recaptured several times by the contending forces during the war. During the operations between the Russian Soviet Government and the Polish forces, in the summer of 1920, Dubno was captured by the Poles and was by them held for a short period.

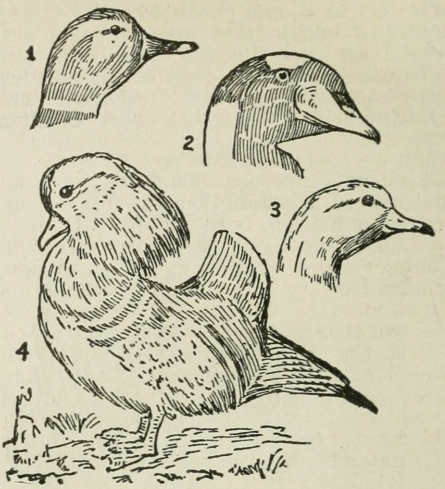
DU BOIS, a city of Pennsylvania, in Clearfield co. It is on the Buffalo and Susquehanna, the Buffalo, Rochester and Pittsburgh, the Lake Shore and Michigan Southern, and the Pennsylvania railroads. The most important industry is the mining of bituminous coal. There are also glass and clay works, blast furnaces, railroad shops, machine shops, etc. There is a hospital and a public library. Pop. (1910) 12,623; (1920) 13,681.

DUCATO, CAPE (dō-kä'tō) (ancient Leukate), an abrupt headland at the S. W. extremity of Leukes or Santa Maura, one of the Ionian Islands, dreaded by sailors for the fierce currents around it. On the summit are remains of a temple of Apollo, and from here criminals were anciently cast into the sea. Here, too, tradition fixes the scene of Sappho's fatal leap, and that of Artemisia of Halicarnassus.

DUCATOON, formerly a Dutch silver coin worth 3 gulden, 3 stivers, or $1.30. There were coins of the same name in Italy. In Tuscany its value was about $1.35, in Savoy slightly more, and in Venice about $1.18.

DU CHAILLU, PAUL BELLONI (dü-shī-yü'), a French-American explorer and writer; born in Paris, July 31, 1835. His travels in Africa, in which he discovered the gorilla and the pigmies, are detailed in "A Journey to Ashango Land" (1867), and "My Apingi Kingdom" (1870). "The Land of the Midnight Sun" (1881) deals with Norway. "The Viking Age" (1887), is a more ambitious work, intended to recreate the old Norse civilization. Among his other works are: "Ivar the Viking"; "The Land of the Long Night" (1899); "The World of the Great Forest" (1900), and many books for the young. He died April 30, 1903.

DUCK, the popular name given to various *Anatidæ*, and especially to those of the two sub-families *Anatinæ* and *Fuligulinæ*. The former are called by Swainson, river ducks, or sometimes also true ducks, and the latter sea ducks. A similar distinction into sea ducks and pond ducks had long ago been made by Willughby. The *Anatinæ* have the bill broad and lengthened, the nostrils basal, the legs very short, and the hinder toe slightly lobed. The *Fuligulinæ* have the



DUCKS
1. Ring Necked Duck 3. American Widgeon
2. Surf Scoter 4. Mandarin Duck

hinder toe very broad. The *Anatinæ*, or true ducks, are migratory birds, coming and going in large flocks.

DUCK, a species of coarse cloth made of flax, lighter and finer than canvas.

DUCKING STOOL, a chair in which scolding and vixenish wives were formerly securely fastened, to receive the punishment of being ducked in water. The woman was placed in the chair with her arms drawn backward; a bar was placed across her back and inside her elbows, while another bar held her upright; in this uncomfortable position she was securely tied with cords. The persons appointed to carry out the punishment, by raising their end of the beam, caused the unfortunate culprit to go overhead into the water. The practice of using the ducking stool began in the 15th century, but had almost died out by the close of the 18th.

DUDEVANT, MADAME. See SAND, GEORGE.

DUDLEY, LORD GUILDFORD, son of John, Duke of Northumberland, was married in 1553 to Lady Jane Grey, whose claim to the throne the duke intended to assert on the death of Edward VI. On the failure of the plot Lord Guildford was condemned to death, but the sentence was not carried into effect till the insurrection of Wyatt induced

Mary to order his immediate execution (1554).

DUDLEY, JOHN, Duke of Northumberland, son of Sir Edmund Dudley, minister of Henry VII.; born in 1502. He was left by Henry VIII. one of the executors named in his will, as a kind of joint-regent during the minority of Edward VI. Under that prince he manifested the most insatiable ambition and obtained vast accessions of honors, power, and emoluments. The illness of the king, over whom he had gained complete ascendency, aroused his fears, and he endeavored to strengthen his interest by marrying his son, Lord Guildford Dudley, to Lady Jane Grey, descended from the younger sister of Henry VIII., and persuaded Edward to settle the crown on his kinswoman by will, to the exclusion of his two sisters, the Princesses Mary and Elizabeth. The death of the king, the abortive attempts to place Lady Jane Grey on the throne, and the ruin of all those concerned in the scheme are among the most familiar events in the annals of England. He was beheaded in 1553.

DUDLEY, ROBERT, Earl of Leicester. See LEICESTER.

DUEL, a premeditated and prearranged combat between two persons with deadly weapons, for the purpose of deciding some private difference or quarrel. The combat generally takes place in the presence of witnesses, called seconds, who make arrangements as to the mode of fighting, place the weapons in the hands of the combatants, and see that the laws they have laid down are carried out. The origin of the practice of duelling is referred to the trial by "wager of battle" which obtained in early ages. This form of duel arose among the Germanic peoples, and a judicial combat of the kind was authorized by Gundebald, King of the Burgundians, as early as 501 A. D. When the judicial combat declined the modern duel arose, being probably to some extent an independent outcome of the spirit and institutions of chivalry. France was the country in which it arose, the 16th century being the time at which it first became common. 6,000 persons fell in duels during 10 years of the reign of Henry IV. In 1602 the king issued a decree against dueling, declaring it punishable with death, but the practice continued.

The practice of dueling was introduced into England from France in the reign of James I.; but it was never so common as in the latter country. Cromwell was an enemy of the duel, and during the Protectorate there was a cessation of the practice. It came again into vogue, however, after the Restoration. thanks chiefly to the French ideas that then inundated the court. As society became more polished duels became more frequent, and they were never more numerous than in the reign of George III. Among the principals in the fatal duels of this period were Charles James Fox, Sheridan, Pitt, Canning, Castlereagh, the Duke of York, the Duke of Richmond, and Lord Camelford. The last mentioned was the most notorious duelist of his time, and was himself killed in a duel in 1804. A duel was fought between the Duke of Wellington and Lord Winchelsea in 1829, but the practice was dying out. It lasted longest in the army. By English law fatal duelling is considered murder, and the seconds are liable to the same penalty as the principals. An officer in the army having anything to do with a duel renders himself liable to be cashiered. In France duelling still prevails to a certain extent; but the combats are usually very bloodless. In the German army it is common, and is recognized by law.

In the United States duels are nearly everywhere prohibited by State laws. In some of the States the killing of a man in a duel is punishable by death or by forfeiture of political rights, and in a large number the sending of a challenge is a felony. In the army and navy it is forbidden. During the Revolution there were a number of duels. Alexander Hamilton was slain by Aaron Burr. Decatur was killed and Barron wounded fighting a duel. Andrew Jackson killed Dickinson, and fought several other duels. Henry Clay and John Randolph fought in 1826. De Witt Clinton was a duelist.

DUFFERIN, FREDERICK TEMPLE HAMILTON-BLACKWOOD, MARQUIS OF, a British statesman and author, son of the 4th Baron Dufferin; born in Florence in 1826. He began his public services in 1855, when he was attached to Earl Russell's mission to Vienna. Subsequently he was sent as commissioner to Syria in connection with the massacre of the Christians (1860); was under Indian secretary (1864-1866); under secretary for war (1866); chancellor of the Duchy of Lancaster (1868-1872); Governor-general of Canada (1872-1878); ambassador at St. Petersburg (1879-1881); at Constantinople (1882); sent to Cairo to settle the affairs of the country after Arabi Pasha's rebellion (1882-1883); Viceroy of India (1884-1888); ambassador to Italy (1889), and to France (1891). He died Feb. 12, 1902.

DUFFY, SIR CHARLES GAVIN, an Irish patriot; born in County Monaghan in 1816; early devoted himself to journalism in Dublin and Belfast, returning to the former in 1842 to start along with

Thomas Davis and John Dillon the "Nation" as the organ of the Young Ireland party. Tried and convicted for sedition with O'Connell in 1844, but saved by the House of Lords quashing the conviction, he aided his great chief in the agitation for repeal and next helped him to found the Irish Confederation. He had an active share in promoting the Tenant League and the Independent Irish party, and on the break-up of the latter emigrated to Australia in 1856. After some time of practice at the Melbourne bar, following the establishment of the Victorian constitution, he rose in 1857 to be Minister of Public Works, of Lands in 1858 and 1862, and Prime Minister in 1871. He was defeated next year, was knighted in 1873, and in 1877 elected Speaker of the Legislative Assembly. His little work, "The Ballad Poetry of Ireland" had been for 30 years a household book in his native country, when in 1880 he published "Young Ireland; a Fragment of Irish History, 1840-1850," and in 1883 its sequel, "Four Years of Irish History, 1845-1849." He died Feb. 9, 1903.

DU GUESCLIN, BERTRAND (dü-gā-klan), Constable of France; born about 1314. Mainly to him must be attributed the expulsion of the English from Normandy, Guienne, and Poitou. He was captured by Chandos at the battle of Auray in 1364, and ransomed for 100,000 francs. While serving in Spain against Peter the Cruel he was made prisoner by the English Black Prince; but was soon liberated. For his services in Spain he was made Constable of Castile, Count of Trastamare, and Duke of Molinas; and in 1370 he was made Constable of France. He died in 1380.

DUKE, in Great Britain, the highest rank in the peerage. The first hereditary duke in England was the Black Prince, created by his father, Edward III., in 1336. The Duchy of Cornwall was bestowed upon him, and was thenceforward attached to the eldest son of the king, who is considered a duke by birth. The Duchy of Lancaster was soon after conferred on Edward's third son, John of Gaunt, and hence arose the special privileges which these two duchies still in part retain. A duke in the British peerage, not of royal rank, is styled "your grace," and is "most noble"; his wife is a duchess. The coronet consists of a richly chased gold circle, having on its upper edge eight golden leaves of a conventional type called strawberry leaves; the cap of crimson velvet is closed at the top with a gold tassel, lined with sarsnet, and turned up with ermine. At various periods and in different continental countries the title duke (*Herzog* in Germany until the close of the World War) has been given to the actual sovereigns of small states.

DUKHONIN, GENERAL, a Russian soldier, on the General Staff during the World War, who succeeded General Kornilov in command of the Russian army when the latter was arrested by the Provisional Government for his attempt to assume dictatorial powers in the summer of 1917. General Dukhonin was in command at the front when the Bolsheviki precipitated their revolution and came into power, during the second week of November, 1917. When commanded by the Soviet Government to send a flag of truce through the lines to open negotiations with the Germans, for the purpose of discussing peace terms, General Dukhonin refused, whereupon he was displaced by Abram Krylenko. A few days later he was thrown off a moving train by his own soldiers and killed.

DUKLA PASS, the largest and most accessible pass through the Carpathian Mountains. Through this the Austrians conducted their main operations against the Russians in the southernmost part of the eastern front, during the first six months of the World War. On Dec. 25, 1914, the Russians began a strong offensive into the Carpathians which resulted in their capture of all the passes through the mountains, including Dukla. In the spring campaign of 1915 the Austrians attempted to recapture the Carpathian passes, and sanguinary battles were fought in this region, especially in Dukla, where the Russians retained their positions, being dislodged from all the others, with one exception, Lupkow Pass. The final Russian retirement from the Carpathian passes was caused by lack of munitions and other war supplies rather than by the assaults of the enemy.

DULCIMER, one of the most ancient musical instruments, used by various nations in almost all parts of the world, and, in shape and construction, having probably undergone fewer changes than any other instrument. In its earliest and simplest form, it consisted of a flat piece of wood, on which were fastened two converging strips of wood, across which strings were stretched tuned to the natural scale. The only improvements since made on this type are the addition of a series of pegs, or pins, to regulate the tension of the strings, and the use of two flat pieces of wood formed into a resonance-box, for the body. The German name, *Hackbrett* (chopping-board)

points to the manner in which it was played, the wires being struck by two hammers, one held in each hand of the performer. The fact which makes the dulcimer of the greatest interest to musicians is that it is the undoubted forefather of our pianoforte.

DU LHUT (dü löt), **DANIEL GREYSOLON**, an American pioneer; born in France about 1645; went to Canada about 1670, and became a trader and a leader of bushrangers. He chose the sites of Detroit and Fort William, fought in the Canadian war with the Senecas in 1687, and against the Iroquois in 1689, and was commander of Fort Frontenac in 1695. The city of Duluth is named after him.

DULUTH, a city, port of entry, and county-seat of St. Louis co., Minn.; at the head of Lake Superior and the mouth of the St. Louis river. It is the terminus of several important railway systems, including the Northern Pacific, the Chicago and Northwestern, and the Great Northern. It has a splendid harbor on St. Louis bay, extending nine miles into the lake and inclosed by natural breakwaters.

The public buildings are noticeable for their beauty and costliness. The Federal buildings are among the finest in the West. Other notable structures are the High School, City Hall, Chamber of Commerce, Lyceum Theater, Public Library, State Normal School, U. S. Fisheries buildings. Besides these there are over 60 churches, many of which are very ornate in construction and equipment.

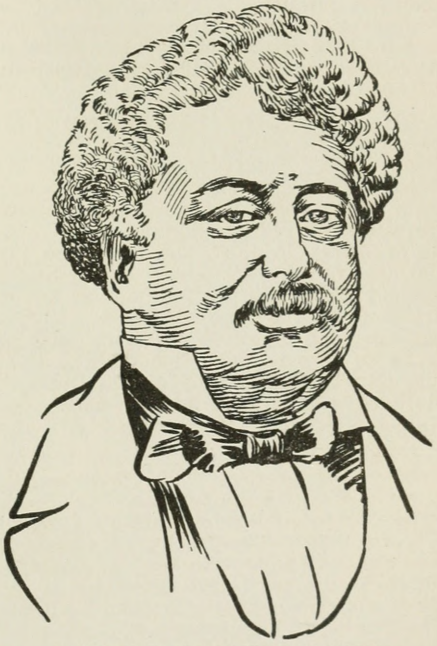
The port is connected by steamer lines with all important points on the Great Lakes, and has a very large commerce in coal, iron, grain, and lumber. Trade is greatly facilitated by the Sault Ste. Marie canal, whose traffic now exceeds that of the Suez canal. The imports in the fiscal year 1920 amounted to $17,082,468 and the exports to $34,360,373.

Although pre-eminently a commercial city, Duluth has important manufactures, The principal articles of manufacture were lumber, iron and steel. Other important industrial plants were blast furnaces, stove factories, and railroad car shops. There are valuable quarries of granite, trap, slate, and sandstone near by, and the fisheries of the vicinity are quite important.

In 1919 Duluth had 4 National banks with a capital of $500,000, and several State and private banks, besides a considerable number of loan and trust companies, and building and loan associations.

History.—In May, 1869, the site of the city was a forest; the old Duluth, at that time situated on Minnesota Point, consisted of a few cabins. The place is named after Captain Du Lhut, a French traveler, who visited it and built a hut in 1670. It was chartered as a city in 1869, and was later enlarged by the annexation of the suburbs, Lake Side and West Duluth. Pop. (1910) 78,466; (1920) 98,917.

DUMAS (dü-mä'), **ALEXANDRE**, the Elder, a celebrated French romancist and dramatist; born in Villers-Cotterets, Aisne, July 24, 1802. He was grandson of a French marquis and a San Domingo negress. In 1823 he went to Paris and obtained an assistant-secretaryship from the Duke of Orleans, afterward Louis Philippe. In 1829 he scored his first success with his drama "Henry III." The same year appeared his "Christine," and in quick succession



ALEXANDRE DUMAS, THE ELDER

"Antony," "Richard d'Arlington," "Térésa," "Le Tour de Nesle," "Catharine Howard," etc. Dumas had now become a noted Parisian character. The critics fought over the merits of his pieces, and the scandalmongers over his prodigality and galanteries. Turning his attention to romance, he produced a series of historical romances.

A few of the great multitude of his famous romances are: "The Count of Monte Cristo" (1844); "The Three Mus-

keteers" (1844); "Twenty Years After" (1845); "The Knight of Maison-Rouge" (1846); "Viscount de Bragelonne" (1847); "Queen Margot" (1847). Many of his stories were of great length, 6 to 12 volumes. Besides pure fiction he wrote a number of historical romances, as "Joan of Arc" (1842); "Michelangelo and Raffaelle" 1846); "Louis XIV. and His Age" (1847). His plays, which had extraordinary success, include: "Henri III. and His Court" (1829); "Antony" (1831); "Charles VII. with His Gra d Vassals" (1831), "Mlle. de Belle-Isle" (1839); "Marriage Under Louis XV." (1841); "The Misses St. Cyr" (1843). Nearly all his novels were put on the stage also. He wrote entertaining narratives of his travels in Switzerland, Italy, Germany, Spain, north Africa, Egypt, Syria, etc. The works which bear his name amount to some 1,200 volumes, including about 60 dramas. He died near Dieppe, Dec. 5, 1870.

DUMAS, ALEXANDRE, the Younger, a French dramatist and romancist, son of the preceding; born in Paris, July 27 or 28, 1824. He published his first romance: "Story of Four Women and a Parrot" (6 vols. 1847), which found little favor. Among his romances are: "A Woman's Romance"; "Cesarine"; "Camille" (La Dame aux Camélias); all in 1848. His dramas include: "Diana de Lys" (1853), and "The Demi-Monde" (1855). He also wrote the romance, "The Clémenceau Case" (1864), dramatized under the same name; and the dramatic pieces: "The Natural Son" (1858); "The Friend of Women" (1864); "Claude's Wife" (1873); "The Danicheffs" (1876); "Francillon" (1887); and others. He died in Paris, Nov. 28, 1895.

DU MAURIER, GEORGE LOUIS PALMELLA BUSSON (dü-mō-ryā'), a famous delineator of English society in "Punch," and in later years a novelist; born in Paris, March 6, 1834. In his childhood his parents settled in London. He began in 1850 to study art in London, Paris, and Antwerp; returning to London he was employed on the illustrated periodicals, and from 1864 to his death was of the regular staff of "Punch." He wrote and illustrated three stories: "Peter Ibbetson" (1891); "Trilby" (1894); "The Martian" (1897). He died in London, Oct. 8, 1896.

DUMBA, KONSTANTIN THEODOR, Austro-Hungarian Ambassador to the United States in 1914, at the outbreak of the World War. The United States was at this time holding a neutral attitude toward the war in Europe. On Aug. 30, 1915, an American correspondent was arrested in Falmouth, England, as he was landing from a trans-Atlantic liner and among his papers, which were seized, was found a message from Dr. Dumba to Baron Burian, the Austro-Hungarian Foreign Minister. In this letter the Austrian Ambassador suggested the blowing up of a number of American munition factories, which were supplying Great Britain and her allies with war supplies. For this purpose, and general propaganda, funds were requested. The United States Government thereupon forced the official recall of Dr. Dumba.

DUMBARTONSHIRE, a county of Scotland, with an area of 267 square miles. The northern and southern parts are mountainous, with an elevation of from 2,000 to 3,000 feet. Within the county are included many beautiful lakes, including Loch Lomond. The chief industries are dyeing, the printing of calicoes, engine and ship-building, brewing and distilling, and the mining of coal and iron. Pop. about 140,000. The capital is Dumbarton.

DUM-DUM BULLETS, a bullet so named after the place near Calcutta where it was first made. It is one which instead of having its greatest strength at the point is weakest there, so that in striking a bone it will flatten out and shatter it, and not, like the modern steel-coated, sharp-pointed bullet, make a small hole and pass through without any other effect. The loading of rifles with two bullets, with jagged bullets, or with bullets mixed with glass or lime has long been forbidden in civilized warfare. At Santiago the Spaniards were charged with cutting off the brass tips of their bullets so that they had the same effect in inflicting jagged wounds as the regular dum-dum bullets. Dum-dum bullets are now used to some extent by big game hunters. The Hague Peace Congress agreed that dum-dum bullets should not be used in war.

The same charge was brought against the British by the Germans in the World War, but was never proven officially.

DUMFRIES (dum-frēs'), a river port, railway center and parliamentary borough, capital of the county of same name, and the chief place in the S. of Scotland; on the left bank of the Nith, about 6 miles from its junction with the Solway Firth. It is connected with the suburb Maxwelltown (in Kirkcudbright) by three bridges, one dating from the 13th century. Pop. about 19,000.

DUMFRIESSHIRE, a county of Scotland in the southern division. It has an

area of 1,072 square miles. It is mountainous in the northern part. There are mines of coal, limestone, lead, silver, and zinc. The chief industries are agriculture and cattle and sheep raising. In the numerous rivers are abundant salmon. Pop., about 75,000. The capital is Dumfries.

DU MOND, FRANK VINCENT, an American artist, born in Rochester, N. Y., in 1865. He was educated in Paris and was awarded a medal at the Paris Salon in 1890. He also received medals at the Boston Exposition of 1892, the Atlanta Exposition of 1895, the Buffalo Exposition of 1901, and the St. Louis Exposition of 1904. He was a member of the National Academy and of other art and architectural societies.

DUNAJEC, BATTLE OF, named after the Dunajec river, one of the most important engagements between the Russians and the forces of the Central Empires fought during the early part of the World War. The object was to drive back the Russians, who had invaded eastern Galicia and the Bukowina, and large forces numbering nearly 2,000,000 were massed in this region and placed under the command of General von Mackensen. The fighting began on April 28, 1915, and lasted well into May, the Russian center being broken and the whole Russian front being driven back.

DUNBAR, a town of Scotland; a royal and municipal borough and seaport in Haddingtonshire, at the mouth of the Firth of Forth. It is a place of great antiquity, having originated in a castle once of great strength and importance which underwent several memorable sieges, on one occasion being successfully defended against the English for 19 weeks by Black Agnes, Countess of Dunbar. In 1650 Cromwell totally defeated the Scottish army under David Leslie near the town. The town is an important fishing station. Pop. about 3,500.

DUNBAR, PAUL LAURENCE, an American author; born of negro parents in Dayton, O., June 27, 1872. He was graduated at the Dayton High School in 1891, and since then has devoted himself to literature and journalism. Since 1898 he has been on the staff of the Librarian of Congress. He has written "Oak and Ivy" (poems); "Lyrics of Lowly Life" (poems), and "The Uncalled" (a novel). He died Feb. 9, 1906.

DUNCAN, GEORGE BRAND, an American soldier, born in Lexington, Ky., in 1861. He graduated from the United States Military Academy in 1886 and was commissioned 2d lieutenant of the 9th Infantry in the same year. He acted as captain and assistant adjutant-general of volunteers during the Spanish-American War. In 1899 he was honorably discharged from the volunteer service and was commissioned a captain in the regular army. He rose through the various grades, becoming colonel in 1916. In 1917 he was appointed brigadier-general of the National Army and in 1918 became major-general. He served in France with the American Expeditionary Force from June, 1917, to June, 1919. He was commander in turn of the 26th Infantry of the 1st Division, and of the 1st Brigade of the 1st Division. He was the first American general who commanded a sector on the battle front, north of Toul. From May to August, 1918, he commanded the 77th Division, and during the Meuse-Argonne offensive he commanded the 82d Division. He continued to command this Division until its demobilization in March, 1919. He was awarded decorations by the French and English Governments and received the Distinguished Service Cross from the United States Government.

DUNCIAD, THE, a celebrated satirical poem by Pope, in which he gibbets his critics and foes. The first three books were published in 1728; the fourth book, or "New Dunciad," appeared in 1742, with illustrations by Scriblerus and notes variorum. Cibber was latterly substituted for Theobald as the hero, and among others who figured in the satire were Ambrose Philips, Blackmore, Bentley, Defoe, Dennis, Shadwell and Settle.

DUNDAS. (1) A baronial castle dating from the 11th to 15th centuries, with modern additions, on the S. bank of the Firth of Forth, near South Queensferry, the seat from about 1124 till 1875 of the family of Dundas. (2) A town of Wentworth co., Ontario, at the head of Burlington Bay, at the W. of Lake Ontario, with a number of mills and manufactories. (3) An island of British Columbia, 40 miles N. E. of Queen Charlotte Island and separated by Chatham Sound from the most southerly of the Alaskan islands. (4) A group of nearly 500 islets (also called the Juba Islands), all of coralline formation, lying off the E. coast of Africa, in about 1° S. lat., with only one secure harbor. (5) A strait in north Australia, separating Melville Island from Coburg Peninsula, about 18 miles broad.

DUNDEE, a flourishing borough and seaport of Scotland in County Forfar, on the Tay, 8 miles from the sea, and 37½ miles N. E. of Edinburgh. It has a fine harbor, and splendid docks, and manufactures osnaburgs and other coarse

linens, canvas and bagging for export, and colored threads and gloves. Dundee possesses many shipyards, sugar refineries, tanneries, and machine shops. Its linen trade is the largest in Great Britain. Pop. (1918) 181,777.

DUNEDIN (dun-ē'din), capital of Otago, New Zealand; the most important commercial town in the colony; at the upper extremity of an arm of the sea, about 9 miles from its port, Port Chalmers, with which it is connected by railway. Though founded in 1848, its more rapid progress dates only from 1861, when extensive gold fields discovered in Otago attracted a large influx of population. It is well paved, lighted with gas, and has a good supply of water. There are many handsome buildings, both public and private. Wool is the staple export. Several woolen and other manufactories are now in existence. There is a regular line of steamers between this port and Melbourne, and communication is frequent with all parts of New Zealand. Pop., including suburbs, about 70,000.

DUNFERMLINE, a town in Fife, Scotland, 16 miles N. W. of Edinburgh; on a long swelling ridge, 3 miles from and 300 feet above the Forth, and backed by the Cleish Hills (1,240 feet), presents a striking aspect from the S. It is a place of antiquity, from 1057 till 1650 a frequent residence of Scotland's kings, and for more than two centuries their place of sepulture. It was here that Charles II. signed the Covenant in 1650. In 1911 the boundaries of the burgh were extended to the Firth of Forth. Considerable trade is done in linen manufactured here. Pop. about 28,000.

DUNKERQUE, or **DUNQUERQUE**, a fortified seaport town of France, department of Le Nord, 40 miles from Lille. It is well built, and has several churches, a theater, concert hall, hospitals, a college, public library, and military prison, and is defended by a citadel. The churches are less remarkable for architecture than for the paintings they contain. Large sums were expended by the French Government on its harbor and docks; these it was agreed to demolish at the peace of Utrecht, but their destruction was never completed, and at the peace of 1783 they were restored. In 1388 this town was burned by the English; after which its possession was repeatedly contested by the French and Spanish. In 1658 it was given up to the English by Turenne; and in 1662, sold by Charles II. to Louis XIV., for $1,000,000. It was made a free port in 1826. In September and October of 1917 during the World War, the town was daily bombarded from sea and land, causing great wreckage and considerable loss of life. Population before the war about 40,000.

DUNKERS, or **DUNKARDS**, a sect of German Baptists, founded by Alexander Mack, about A. D. 1708. Persecution drove them in 1723 to the United States, where they are now divided into four branches.

DUNKIRK, city and port of entry of Chautauqua co., N. Y.; on Lake Erie, and the Erie, the Nickel Plate, the Lake Shore and Michigan Southern, the Western New York and Pennsylvania, and the Dunkirk, Allegheny Valley and Pittsburg railroads; 40 miles S. W. of Buffalo. It is an important shipping port, having a good harbor and facilities for freight handling. Its industries include a plant for the manufacture of locomotives, foundry, planing mills, grain mills, grain and coal elevators, and various other factories. It is a popular summer resort, with a beautiful park overlooking Lake Erie, and has a public library, orphan asylum, public schools, and national banks. Pop. (1910) 17,221; (1920) 19,336.

DUNMORE, a borough of Pennsylvania, in Lackawanna co. It is on the Erie and the Lackawanna railroads, and adjoins Scranton. The borough is an important anthracite coal region and there are manufactures of brick, stone, and silk. It is the seat of St. Mary's Academy, and several homes for children and for the aged. Pop. (1910) 17,615; (1920) 20,250.

DUNNE, EDWARD FITZSIMONS, an American public official; born in Waterville, Conn., in 1853. He was educated in the High School of Peoria, Ill., and for 3 years studied at Trinity College, Dublin. He studied law at the Union College of Law, graduating in 1887. In the same year he was admitted to the bar. From 1892 to 1905 he was judge of the Circuit Court of Cook County, Ill. In the latter year he was elected mayor of Chicago, serving until 1907, when he again engaged in the practice of law. From 1913 to 1917 he was governor of Illinois. He was a prominent figure in Democratic politics. In 1906-1907 he was president of the League of American Mnicipalities, and in 1919 he was a member of the commission from Irish societies of the United States to present claims of Ireland for self-determination at the Peace Conference in Paris.

DUNNE, EDWARD JOSEPH, an American clergyman; born in Tipperary, Ireland, in 1848. He came to the United

States when he was a year old, was educated at the Theological Seminary in Baltimore, and ordained a Roman Catholic priest in 1871. He was appointed Bishop of Dallas, Texas, in 1893.

DUNNE, FINLEY PETER, an American writer, born in Chicago in 1867. He was educated in the common schools and served on the staffs of several newspapers in Chicago from 1885 to 1900. He first attracted attention by the publication in the Chicago "Times-Herald" of a series of sketches in which the chief figure was one Martin Dooley. Upon the publication of these sketches in a volume entitled "Mr. Dooley in Peace and in War," his reputation was established. This was followed by "Mr. Dooley in the Hearts of his Countrymen" (1898); "Mr. Dooley's Philosophy" (1900); "Mr. Dooley's Opinions" (1901); "Observations by Mr. Dooley" (1902); and "Mr. Dooley Says" (1910). He served as editor for several publications and in 1918-1919 was editor of Collier's Weekly. He was a member of the National Institute of Arts and Letters.

DUNOIS, JEAN (dün-wä'), called the Bastard of Orleans, Count of Dunois and Longueville, one of the most brilliant soldiers that France ever produced; born in Paris, Nov. 23, 1402, the natural son of Louis Duke of Orleans, brother of Charles VI., and was brought up in the house of that prince along with his legitimate children. His first important military achievement was the overthrow of the English at Montargis (1427). He next threw himself into Orleans with a small body of men, and bravely defended the place till the arrival of the famous Joan of Arc, whose religious enthusiasm combined with the valor of Dunois restored the drooping spirits of the French, and compelled the English to raise the siege. This was the turning point in the fortunes of the French nation. In 1429 Dunois and the Maid of Orleans won the battle of Patay, after which he marched, with a small body of men, through the provinces then overrun by the English and took the fortified towns. The capture and death of Joan of Arc arrested for a moment the progress of the French arms, but the heroism of Dunois was irresistible. He took Chartres, the key of Paris, forced Bedford to raise the siege of Lagny, chased the enemy from Paris, and within a very short period deprived them of all their French conquests except Normandy and Guienne. In 1448-1450 he drove the English from Normandy, and in 1455 he had swept them from Guienne also, and permanently secured the freedom of France from all external pressure. For his participation in the league of the nobles against Louis XI. he was deprived of all his offices and possessions, which were, however, restored to him under the treaty of Conflans (1465). He died Nov. 24, 1468.

DUNSANY, EDWARD JOHN MORETON DRAX PLUNKETT, BARON, an English poet and dramatist. He was born in 1878 and was educated at Eton. He was a captain in the 1st Battalion Royal Inniskilling Fusiliers and was wounded in 1916. His works include: "Gods of Pegana"; "Time and the Gods"; "A Dreamer's Tales"; "Five Plays"; "Plays of God and Men"; "The Glittering Gate"; "The Gods of the Mountain"; "The Tents of the Arabs"; "A Night at an Inn"; "Tales of War," etc.

DUNS SCOTUS, JOANNES (duns skō' tus), a Scotch metaphysician, head of the Schoolmen, called "the subtle doctor"; born in Ireland, 1265 or 1274. His opposition to the Thomists or adherents of Thomas Aquinas was spirited. He wrote an "Exposition of Aristotelian Physics"; "Questions on Aristotle's Work on the Soul"; and similar works. He died in Cologne, Nov. 8, 1308.

DUNSTAN, ST., an Anglo-Saxon ecclesiastic; born in Glastonbury in 925. As a youth he was remarkable for his learning and his skill in music, painting, carving, and working in metals. He entered the Benedictine order, became an anchorite at Glastonbury, and in 945 was made abbot by King Edmund. After the death of Edmund, Edred, the next king, made him his prime minister and principal director in civil and ecclesiastical affairs. In the reign of Edwy he was banished, but was recalled by Edgar, and made Archbishop of Canterbury. He was again deprived of power on the accession of Ethelred in 978. He did much to improve education and to raise the standing and character of the priesthood. He died in Canterbury in 988.

DU PONT, SAMUEL FRANCIS, an American naval officer; born in Bergen Point, N. J., Sept. 27, 1803. He was commissioned a midshipman when 12 years old. During the Mexican War, being then a commander, he saw much active and gallant service on the California coast. In 1856 he was made a captain, and the following year was placed in command of the steam frigate "Minnesota," which conveyed Mr. Reed, the American minister, to China. In 1862 he was put in command of the South Atlantic blockading squadron. He sailed from Fort Monroe, Oct. 29, in his flagship the "Wabash," accompanied by a fleet of 50 sail; reached Port Royal Nov. 5, and two days after attacked two

strong forts, on Hilton Head and Bay Point, which were evacuated after a severe engagement of four hours. He was promoted to rear-admiral in August, 1862. He greatly contributed to the organization of the Naval School at Annapolis, and was the author of a very remarkable report on the use of floating batteries for coast defense. He died in Philadelphia, Pa., June 23, 1865.

DUQUESNE, a borough of Pennsylvania, in Allegheny co. It is on the Monongahela river, and on the Pennsylvania railroad. The city has large steel works and blast furnaces. There is a public library and an institute. Pop. (1910) 15,727; (1920) 19,011.

DUQUOIN, a city of Illinois, in Perry co. It is on the Illinois Central railroad. Its industries include iron works, flour mills, planing mills, etc. There are important coal mines in the neighborhood. Pop. (1910) 5,454; (1920) 7,285.

DURAN, CAROLUS, CHARLES AUGUSTE-ÉMILE, called **DURAND**, a French painter; born in Lille, July 4, 1837. He received his early art education at the municipal school in his native town, and in 1853 went to Paris and spent much time in copying again and again "La Joconde," at the Louvre. He gained the Wicar traveling scholarship and went to Italy, and at Rome painted "La Prière du Soir," exhibited at the Salon in 1865. For "L'Assassiné (1866), he was awarded his first medal. M. Duran resided for a year in Spain, and the influence of Velasquez is clearly seen in his "St. Francis of Assissi," exhibited at the Paris Salon in 1868. But the fame of Carolus Duran rests principally on his portraits, which are very numerous. Among them may be mentioned Emile de Girardin, those of his daughters, the equestrian portrait of Mlle. Croizette, the well-known actress, and a portrait of Pasteur. He was a Chevalier of the Legion of Honor, and of the Order of Leopold. In 1898 he made a lecturing tour to the United States, this being his second visit. In the same year he was elected president of the National Society of Fine Arts. Exhibited at St. Louis Exposition in 1904. Member of French Institute (1915), and Director of French Academy at Rome. He died in Paris, Feb. 18, 1917.

DURANGO, a city of Colorado, the county-seat of La Plata co. It is on the Las Animas river, and on the Denver and Rio Grande and the Rio Grande Southern railroads. The city is a commercial center for southwestern Colorado and northwestern New Mexico. There are smelting and reduction works, flour mills, and a packing plant. The city has a public library and other public buildings.

DURANGO, a state of Mexico, with an area of 38,009 square miles. It is for the most part high and dry plateau and is traversed in the northern part by the Sierra Madre mountains. The soil in general is good and produces wheat, vegetables, sugar cane, and cotton. Corn, tobacco, and grapes are also grown. The principal industry of the state is mining, and its silver mines have been famous from colonial times. Iron and steel are also mined near the city of Durango. Manufacturing has made some progress in recent years. There are soap and candle factories, tanneries, and pottery works. Pop. about 500,000. The capital is Durango.

DURANGO (also called Guadiana and Ciudad de Victoria), a town of Mexico, on a dry plateau, 6,700 feet above sea-level, 500 miles N. W. of the City of Mexico. It is handsomely built, with a cathedral, a former Jesuit college, a theater, and a mint, and the town now has tramways and telephones. Pop. about 33,000.

DURANT, a city of Oklahoma, the county-seat of Bryan co. It is on the Missouri, Oklahoma, and Gulf, the Missouri, Kansas, and Texas, and the St. Louis and San Francisco railroads. It is the center of an important agricultural industry. There are flour and oil mills. The city is the seat of a Presbyterian college, and the Southeastern State Normal School. Pop. (1910) 5,330; (1920) 7,340.

DURANT, E(DWARD) DANA, an American statistician and public official, born in Romeo, Mich., in 1871. He graduated from Oberlin College in 1893, and took post-graduate courses at Cornell University. From 1895 to 1897 he was legislative librarian of the New York State Library, and in 1898-1899 was assistant professor of administration and finance at Leland Stanford, Jr., University. From 1900 to 1902 he was secretary of the United States Industrial Commission. After filling several posts in the government service he was deputy commissioner of corporations from 1907 to 1909. From the latter year to 1913 he was director of the United States Census. He was professor of statistics and agricultural economics at the University of Minnesota from 1913. He wrote extensively on financial matters, and his published writings include "Finances of New York City" (1898); and "The Trust Problem" (1915). He also

contributed many articles on economical and political subjects to economic journals. From 1917 he was assistant head of the Meat Division of the United States Food Administration, at Chicago.

DURANT, HENRY FOWLE, an American philanthropist; born in Hanover, N. H., Feb. 20, 1822. He was graduated from Harvard in 1842 and became a lawyer, changing his name from Henry Welles Smith to H. F. Durant. He practiced with great success at the bar, but on the death of his only son abandoned his profession and devoted his energies to philanthropy. He founded Wellesley College (opened in 1875), and was successful as a lay preacher. He died in Wellesley, Mass., Oct. 3, 1881.

DURAZZO (dö-rät'sō), a port of Albania, built on the rocky peninsula of Pelu, in the Adriatic, 50 miles S. of Scutari. It is a decayed place with a ruined citadel; but the harbor is the most important of middle Albania. Durazzo is the ancient Epidamnos, founded about 625 B. C. by Corcyræans and Corinthians. It became a great and populous city, but was much harassed by the party strifes, which ultimately led to the Peloponnesian War. Under the Romans it was called Dyrrachium (whence its modern name), and became the principal landing-place for those sailing from Brundusium in Italy to Greece; and the great military road to the Hellespont began here. The town was captured by the Austrians Feb. 28, 1916. June 3, 1917, the Italians set up a provisional government here. Pop. about 5,000.

DURBAN, the seaport of the colony of Natal, south Africa; on the N. shore of a nearly land-locked tidal bay. The climate, though hot in one or two summer months, is healthy and suitable for Europeans. The town was laid out by the Dutch, who formed a republic in Natal before the British, under Sir Benjamin D'Urban, took the colony in 1842. The public buildings include a capacious town hall, museum, library, etc. The Town Gardens form a conspicuous open space in the middle of the town, and besides the Botanical Gardens, there are two public parks. The residences of the inhabitants are chiefly situated on the Berea, a low range of hills overlooking the town. The port, which has a lighthouse, is the entrepôt for coal from several interior parts of the colony. Great harbor works (1888-1895) have made the inner harbor (4,700 acres) accessible at all times to vessels of deep draught. During the war against the Boers in 1899-1900 the British made Durban a base of supplies. Pop. (1918) 48,413.

DÜRER, ALBERT, a German painter, designer, sculptor, and engraver on wood and metal; born in Nürnberg in 1471. His father was a skillful goldsmith of Hungary. In 1486 he left his father's trade and became an apprentice of Michael Wohlgemuth, then the best painter in Nürnberg. At Nürnberg he married the daughter of Hans Frey, a mechanic, who has been falsely accused for centuries of embittering his life and bringing him to his grave. In 1505 he went to Venice to improve himself in his art. He painted the "Martyrdom of Bartholomew" for St. Mark's Church, which painting was purchased by the Emperor Rudolph and removed to Prague. He also traveled to Bologna, to improve his knowledge of perspective. On his return to Nürnberg his fame spread far and wide. Maximilian I. appointed him his court painter, and Charles V. confirmed him in this office. He was the first in Germany who taught the rules of perspective, and of the pro-



ALBERT DÜRER

portions of the human figure. He not only made use of the burin, like his predecessors, but was also among the first to practice etching. He invented the method of printing woodcuts with two colors. Among his masterpieces in painting are a "Crucifixion," "Adam and Eve," an "Adoration of the Magi," the "Adoration of the Trinity," in the Belvedere Gallery, Vienna; and portraits of Raphael, Erasmus, and Melanchthon, who were his friends. Among his best engravings on copper are his "Fortune," "Melancholy," "Adam and Eve in Paradise," "St. Hubert," "St. Jerome," and the "Smaller Passion" (so called), in 16 plates. Among his best engravings on wood are the "Greater Passion" (so called), in 13 plates; the "Smaller Passion," with the frontispiece, 37 pieces;

the "Revelations of St. John," with the frontispiece, 15 plates; the "Life of Mary," two prints, with the frontispiece. Dürer has also much merit as a writer, and published works on "Human Proportion," "Fortification," and the "Use of the Compass and Square." He died in Nürnberg in 1528.

DURESS, in law, a condition that may be either physical, that is, by actual confinement or restraint of liberty, or moral, that is, by threats or menaces, *duress per minas;* in either case the overt act must be to compel a person to do some act, as to execute a deed or commit an offense: in such case the act is invalid and excusable. Thus, if a man is violently assaulted, and has no other possible means of escaping death, he is permitted to kill his assailant; for here the law of nature and self-defense, its primary canon, has made him his own protector.

DURHAM, a city in Durham co., N. C.; on the Southern Air Line, the Southern, the Durham and South Carolina, and the Durham and Southern railroads; 26 miles N. W. of Raleigh. It is a tobacco and cotton-growing center, and the seat of Trinity College (M. E., S.). The manufacture of smoking tobacco is the staple industry of the place. It was the scene of the treaty between Generals Sherman and Johnston at the close of the Civil War. It has 2 National banks and two newspapers. Pop. (1910) 18,-241; (1920) 21,719.

DURHAM, an ancient city and parliamentary borough in England, capital of the county of the same name, on the river Wear, which is crossed here by four bridges, 14 miles S. of Newcastle. The principal public buildings are the ancient castle (now appropriated to the uses of the university), the cathedral, and other churches, the town hall, county prison, and the grammar school. The educational institutions comprise the university, the grammar school, training school for school-mistresses, and other schools. There are manufactures of carpeting and mustard. The cathedral occupies a height overlooking the Wear. The larger portion of it is Norman in style, with insertions in all the English styles. Three magnificent and elaborately ornamented towers spring up from the body of the building, one from the center 212 feet high, and two together from the W. end, each 143 feet high; the entire length is 420 feet. It was founded by William de Carilephe and Malcolm, King of Scotland, in 1093. Pop. about 15,000.

DURHAM, JOHN GEORGE LAMBTON, EARL OF, an English statesman; born in Lambton Hall, Durham, April 12, 1792. Of decided liberal sympathies, he was in 1813 elected to Parliament for his native county, and took an active part in furthering all projects of a reforming tendency. In 1828 he was raised to the peerage, with the title of Baron Durham of the city of Durham. Under the administration of Lord Grey (1830) he held the office of Lord Privy Seal, and was one of the four persons who drew up the Reform Bill, and supported it in the House of Lords. He resigned office in 1833 and was made an earl. For a time he was ambassador at St. Petersburg. In 1838 he was appointed governor-general of Canada, where, owing to the revolt of the French in lower Canada, the constitution had been suspended. Lord Durham's measures were statesmanlike, but dictatorial; and the House of Lords voted disapproval of some of his acts. Thereupon he took the extraordinary step of returning to England without being either recalled or obtaining the royal consent. Lord Durham's famous report on Canada (which, however, was mainly written by his secretary, Charles Buller) anticipated many of the best features in the present Canadian constitution. He died in Cowes, Isle of Wight, July 28, 1840.

DÜRRENSTEIN (dür'en-stīn), a village in lower Austria, on the Danube, 41 miles N. W. of Vienna. Here are the ruins of the castle in which Leopold, Duke of Austria, imprisoned Richard Cœur de Lion on his return from Palestine, in 1192.

DURUY, VICTOR (dü-rüē'), a French historian; born in Paris, Sept. 11, 1811. He assisted Napoleon III. in compiling "The Life of Julius Cæsar," and was made minister of public instruction in 1863. Among his historical works are: "History of the Romans" (2 vols. 1843); "State of the Roman World Toward the Time of the Founding of the Empire" (1853); "General Introduction to the History of France" (1865); "History of the Greeks" (5 vols. 1886). He also wrote the greater part of a "Universal History." He died Nov. 25, 1894.

DURYEA, a borough of Pennsylvania, in Luzerne co. It is on the Lackawanna river, and on the Erie, the Lehigh Valley, and the Delaware, Lackawanna and Western railroads. Its chief industries are the mining of coal and the manufacture of silk. Pop. (1910) 7,487; (1920) 7,776.

DUSE, ELEONORA (dō'sā), an Italian actress; born in Vigevano, Italy, in 1861. She inherited histrionic talent from her ancestors, and has gained a

great reputation in emotional rôles. She has played in all the principal countries of Europe and visited the United States in 1892-1893. Though her genius is undoubted, her disposition prevents her from becoming a popular favorite. She made her first appearance on the stage at the age of 7. At 20 she married the actor-journalist Signor Checci, but they soon separated. Her name was long associated with that of D'Annunzio, who wrote plays for her, and in which she continued to act after they quarrelled in 1899. Her most famous rôles are: "Marguerite," "Paula," "Magda," "Le Femme de Claude," and "Le Locandiere." She toured the United States in 1893, 1896, 1902 and 1903.

DÜSSELDORF, a town of Prussia, in the Rhenish province, beautifully situated on the right bank of the Rhine, 22 miles N. N. W. of Cologne, one of the handsomest towns in the valley of the Rhine. It is a great focus of railway and steamboat communication, and has a number of handsome public buildings, and several remarkable churches. Among the public institutions particular notice is due to the Academy of Art, founded, 1767, by the Elector Theodore, and afterward directed by Cornelius, Schadow, Bendemann, etc. It has the honor of having founded a school of painting, which takes the name of Düsseldorf. The industries embrace iron, cotton, leather, tobacco, carpets and chemicals. The city was occupied by French troops on March 7, 1921. Pop. about 365,000.

DUVAL, CLAUDE (dü-väl'), an English highwayman; born in Domfront, Normandy, in 1643. He went to England at the Restoration, in the train of the Duke of Richmond. Taking soon to the road, he robbed many gentlemen of their purses, and ladies of their hearts, till, having been captured while drunk, he was hanged at Tyburn, Jan. 21, 1670, and was buried in the mid aisle of Convent Garden Church.

DUYCKINCK, EVERT AUGUSTUS (di'kingk), an American author; born in New York City, Nov. 23, 1816. Graduating from Columbia College, he studied law, was admitted to the bar in 1837. In 1847 he edited the "Literary World." In 1854, with his brother, George, he prepared the "Cyclopædia of American Literature" (2 vols. 1855; enlarged eds. 1865 and 1875). His last work was the preparation, with William Cullen Bryant, of an edition of Shakespeare. He died in New York City, Aug. 13, 1878.

DVORAK, ANTONIN (dvor'zhäk), a Bohemian composer; born near Mühlhausen, Sept. 8, 1841. His father was an innkeeper and butcher. Attention was first called to him by what remains his best work, a "Stabat Mater." He has made great use of Bohemian folk music. His "Bohemian Dances" (two sets), 30 variations on a Bohemian theme for grand orchestra, "Hulsitska" overture; cantata, "The Specter's Bride," and a symphony written for the London Philharmonic Society, are his most widely known works. His oratorio, "St. Ludmilla," was written for the Leeds Festival of Oct. 15, 1887. He came to the United States in 1892, and became director of the National Academy of Music. His "New World Symphony" was produced in 1893. He died May 1, 1904.

DWARF, a human being much below the ordinary size of man. Dwarfs are described by several ancient classical writers. Herodotus gives an account of a race of dwarfs living in Libya and the Syrtes, to which Aristotle and Pliny also refer. Philetas of Cos, distinguished about 330 B. C. as a poet and grammarian was jocularly said to have carried weights to prevent his being blown away. He was preceptor to Ptolemy Philadelphus. Julia, niece of Augustus, had a dwarf named Coropas, two feet and a hand's breadth high; and Andromeda, a freedmaid of Julia's, was of the same height. The best known of modern dwarfs was Charles S. Stratton, "Tom Thumb," born in Bridgeport, Conn. Francis Flynn, "General Mite" was 21 inches high at 16.

DWARKA, a maritime town of Guzerat, India, on the W. side of the peninsula of Kathiawar, in the Dominion of Baroda, 235 miles S. W. of Ahmedabad. On an eminence overhanging the seashore stands a great temple of Krishna, visited annually by 10,000 pilgrims.

DWIGHT, HARRISON GRAY OTIS, an American missionary; born in Conway, Mass., Nov. 22, 1803; was graduated at Hamilton College, New York, in 1825, and became a missionary of the American Board of Commissioners for Foreign Missions in 1820 to the Armenians, making Constantinople the center of his field of operations. He wrote "Researches of Smith and Dwight in Armenia" and "Christianity Revived in the East." He died Jan. 25, 1862.

DWIGHT, THEODORE WILLIAM, an American educator, jurist, and editor; born in Catskill, N. Y., July 18, 1822; was educated at Hamilton College, and pursued the study of law at the Yale Law School; was Professor of Law in Hamilton College and subsequently in

Columbia College, in each of which he founded a law school. He received the degree of doctor of laws from both Rutgers and Columbia colleges, and was (non-resident) Professor of Constitutional Law in Cornell University. He was also interested in philanthropic work, and served as president of the New York Prison Association, vice-president of the New York Board of State Commissioners of Public Charities, and as a member of the "Committee of Seventy," of New York City. In collaboration with Rev. E. C. Wines, D. D., he published "Prisons and Reformatories in the United States," and was associate editor of the "American Law Register." He died in Clinton, N. Y., June 28, 1892.

DWIGHT, TIMOTHY, an American Congregational clergyman; born in Northampton, Mass., May 14, 1752. He was president of Yale College from 1795 to 1817, and was a very conspicuous figure in theology and education. His "Theology Explained and Defended" consists of a course of 173 sermons which has passed through as many as 100 editions. In addition to theological works he wrote "Essay on Light"; "Observations on Language"; "Travels in New England and New York," which is still widely quoted. He also wrote verse; an epic called "The Conquest of Canaan"; "Greenfield Hill," a pastoral; "The Triumph of Infidelity," a satire. He died in New Haven, Conn., Jan. 11, 1817.

DWINA (dwē'nä), the name of two important rivers of Europe. (1) The Northern Dwina has its origin in the confluence of the Suchona and the Jug, two streams rising in the S. of the government of Vologda, and uniting in 60° 46′ N. lat., 46° 20′ E. lon. The Dwina flows generally N. W. through a flat country to the Gulf of Archangel, which it enters by three principal mouths, of which only the easternmost is useful for navigation. The length of the Dwina is about 450 miles (with the Suchona, 760); its basin embraces over 140,000 square miles. Its chief tributaries are, on the left, the Vaga and Emza, and on the right the Pinega and the Vytchegda, the last having a course of some 625 miles, 500 being navigable. The volume of water poured down by this main tributary increases the breadth of the Dwina from about one-third to nearly two-thirds of a mile; near Archangel it widens to over four miles. The river is free from ice from May to October, and is a valuable channel of inland trade. Its waters also are rich in fish. (2) The Western Dwina rises in the government of Tver, not far from the sources of the Volga and the Dnieper, and flows at first W. S. W. in a course almost parallel to the latter stream. From Vitebsk it flows W. N. W. to the Gulf of Riga, which it enters after a course of about 580 miles, navigable from the confluence of the Mezha downward, though the numerous shallows and rapids greatly impede traffic. Its basin is estimated at 32,850 square miles; its average depth of 26 feet at Riga is increased to about 40, and its breadth of 1,400-2,400 feet is extended in some places to a mile during the heavy spring floods which overflow wide tracts of the low-lying lands on either bank. The Western Dwina is connected with the Dnieper, and so with the Black Sea by the Beresina canal, and by other canal systems with the Caspian Sea, and with the Neva and Gulf of Finland, etc. The territory bordering on the Dwina was the scene of almost incessant fighting during the World Wor. In 1920 the Polish and Russian Soviet armies carried on operations here, and the river became a part of the boundary between Poland and the Russian republic. See POLAND.

DYAKS, or **DAYAKS**, the Malay name for the race which constitutes the bulk of the aboriginal population of Borneo, divided into innumerable tribes differing pretty widely in language, customs, and degrees of savageness. Physically they closely resemble the Malays. to whom they are doubtless akin, but are somewhat taller; they are intelligent, hospitable, and unsuspicious, and greatly excel the Malays in truthfulness and honesty. Even the most uncivilized tribes have many ingenious arts and industries, weave cloth, make excellent steel weapons, and erect most serviceable suspension bridges with bamboo poles and withes. Their chief weapon is the blowpipe. The barbarous custom of systematic head-hunting is dying out. The Sea-Dyaks were long famous as untamable pirates.

DYEING, the art of imparting colors to textile and other material, such as cotton, silk, wool, and leather. Dyeing has been practiced from time immemorial. Dyeing with colors obtained from natural products had reached a high state of perfection when Perkin, in 1856, introduced the first of the coal-tar colors. Since that date the progress of artificial color-making has been so rapid, and the application of the new dyes made so simple, that, excepting indigo, logwood and cutch, the old colors and processes are now practically driven out of use.

If the fiber is of animal origin, such as silk or wool, a simple immersion in a bath containing the color will usually dye the fabric; but color so applied to a

vegetable substance—as cotton, linen, or jute, is easily washed off, except in the case of the "direct" colors. Vegetable substances are consequently usually treated with mordants (see CALICO). Mordants are substances which form insoluble precipitates with the dyes in the body of the fiber. The mordants most largely used are tannic acid, the salts of antimony, aluminum, and chromium.

Dyeing of Cotton.—The following is a brief outline of the processes in use for a few important colors:

Black is produced by mordanting the goods with salt of iron and then dyeing in a decoction of logwood or by dyeing in a bath containing logwood, bichromate of potash, and mineral acid. Aniline salts with a suitable oxidizing mixture yield a very fast and valuable black. Bichromates and chlorates are among the substances used as oxidizing agents.

Brown is obtained by working in a catechu or cutch bath and then in a bichromate bath. Bismarck-brown on a tannin mordant, and direct browns, are also used.

Purples and lilacs are obtained from alizarin on an iron mordant, with basic colors, as methyl or Hofmann's violet, on a tannin mordant, and direct dyes.

Red. The fastest red dye is alizarin or Turkey red. The process is rather complicated, involving working in a specially prepared oil, aluminum mordant, steaming, dyeing with alizarin, and dunging. Reds are produced on goods impregnated with an alkaline solution of B naphthol by passing through a bath of diazotized para, with aniline or naphthylamine.

Blue. The best blue in respect to fastness is indigo. The coloring constituent of indigo is indigotine.

Dyeing of Wool.—All the coloring matters obtained from natural products mentioned in connection with cotton are applicable to wool, and in addition cochineal is considerably used. Cochineal with a tin mordant gives a very brilliant scarlet. The basic colors dye wool without the aid of a mordant. Direct colors are applicable to wool. Aniline black is not applicable.

Dyeing of Silk.—Black is the most important color dyed on silk. In dyeing the object is usually to add weight to, or "stuff," the fabric.

Up to the time of the outbreak of the World War, the manufacture of dyes was practically in the hands of Germany or of German controlled organizations. The embargo on the importation of German goods, therefore, created a very serious situation in the United States and American chemists at once set themselves zealously at work to invent and prepare dyes which should take the place of those formerly obtained in Germany. At first the results were unsatisfactory, but by 1919 the dyestuff industry had reached such a successful basis that it was able to manufacture practically all essential dyes. In that year not less than 1,733 chemists were engaged in research and the industry required the services of over 20,000 employees. The total output of nearly 200 firms was over 50,000,000 pounds, with a value of nearly $70,000,000. In March, 1918, the American Dyestuff Manufacturing Association was organized. At an exhibition held in New York City in the same year, samples of dyeing from about 50 American dyestuffs were shown. These samples were subjected to most severe tests, and by comparison with German dyes, established the superiority of the American product. The production of coal tar dyes in the United States in 1918 was about 46,000,000 pounds. The imports in 1915 amounted to practically the same figure. There were exported in 1918 American dyes to the value of nearly $12,000,000; in 1920 it amounted to $25,792,565.

DYER, ALEXANDER BRYDIE, an American soldier, born in Fayetteville, N. C., in 1852. He graduated from the United States Military Academy in 1873 and in the same year was commissioned 2d lieutant of the 4th Artillery. He rose through the various grades, becoming colonel of the artillery corps in 1907. In 1913 he retired from active service. He participated in campaigns against the Indians and in the Philippines. He also served on the Mexican border in 1913. He was the author of "Handbook for Light Artillery" (1896).

DYER, MARY, a Quakeress who suffered persecution under the laws in the early days of Massachusetts, when members of that sect were excluded from the State under penalty of death. She was imprisoned, tried, and condemned to be executed; was reprieved on the scaffold, and forcibly taken out of the State. Her religious enthusiasm, however, was so great that she returned and was hanged on Boston Common, June 1, 1660.

DYERSBURG, a city of Tennessee, the county-seat of Dyer co. It is on the Illinois Central, the Birmingham and Northwestern, and the Chicago, Memphis and Gulf railroads, and on the Forked Deer river. It is the center of an important agricultural region and has an important trade in cotton, wheat, and corn. Its industries include a cotton-seed-oil mill, saw, planing, and flour mills, wagon factories, pressed brick factory, grain elevator, tobacco factory, etc. Pop. (1910) 4,149; (1920) 6,444.

DYNAMIC THEORY, a hypothesis broached by Kant that all matter originated from the action of two mutually antagonistic forces—attraction and repulsion. All the predicates of these two forces are attributed by Kant to motion. As applied to heat, it is a theory or hypothesis—that now is generally accepted as the correct one—which represents a heated body as being simply a body the particles of which are in a state of vibration. This vibratory movement increases as the body is still more heated, and diminishes proportionately as it more or less rapidly cools. It is called also the mechanical theory of heat.

DYNAMITE, an explosive produced by the admixture of nitroglycerin with a siliceous infusorial earth known under the German name as kieselguhr. Nitroglycerin, which can be prepared in small quantities by dropping glycerine into a mixture of strong nitric and sulphuric acids, the temperature being kept as low as possible, was discovered by Sobrero in 1846, but it was not till nearly 20 years later that the experiments of Alfred Nobel, who combined it with the absorbent inert earth just mentioned, placed the new substance on a basis of practical and commercial importance.

Kieselguhr is the mineral remains of a species of algæ; the stem consisted chiefly of silica, and when the organic portions of the moss decayed, the tubular siliceous stem remained, retaining its shape. Beds of kieselguhr, underlying peat, are found in many countries; the principal formations in Europe being in Great Britian (especially Aberdeenshire—that of Skye not being sufficiently absorbent), Germany, and Norway. The raw kieselguhr, after calcination in a specially designed kiln to remove water and organic substance, is ground and sifted, and finally contains about 98 per cent. pure silica with traces of lime and iron.

Dynamite, which has a reddish-brown color, consists of 1 part of kieselguhr to 3 parts of nitroglycerin, and has a specific gravity varying from 1.59 to 1.65. Dynamite burns with a yellowish flame, and in small quantities without danger; but explodes with great violence when fired by a detonating fuse. Dynamite is much employed in breaking up boulders and the heavier metal castings, also in agricultural operations for removing the roots of trees.

DYNAMO, DYNAMO-ELECTRIC MACHINE, or **GENERATOR**, a machine for transforming mechanical into electrical energy, and depending for its operation on the electro-motive force developed in any conductor moved transversely through the lines of force in a magnetic field. The manner in which the energy transformation is effected distinguishes the dynamo from the old frictional electric machine, and determines its general plan of construction.

Any dynamo must consist of at least two parts, the field-magnets which create the magnetic field, and the armature which comprises the conducting system which moves relative to the field. To these may be added the commutator, a device necessary to secure uniform direction in the case of direct current machines. Dynamos for direct current are designed invariably with moving armature and fixed fields. In the case of machines of comparatively small capacity, the field magnet may be bipolar, *i. e.*, having one pair of poles, as in the horseshoe magnet. In fact, permanent steel magnets of this form constitute the fields of the little machines known as magneto-electric machines, or magnetos, such as are used in automobiles, in telephony, etc. Bipolar machines may be either of the overtype or undertype pattern, according as the space between the poles is arranged above or below the yoke, which corresponds to the bend of the horseshoe. The former arrangement is practicable only with smaller sizes, as it necessitates longer pedestals for supporting the bearings of the armature shaft, leading to excessive vibration. The undertype has the disadvantage that the field magnets must be supported clear of the iron bed-plate by brackets of non-magnetic material, such as brass or gun-metal, in order to prevent passage of the field through the bed-plate in preference to the armature.

In any dynamo, the current passing through the moving armature causes a distortion and weakening of the magnetic field. This effect becomes very apparent in bipolar machines at high loads, and the serious disadvantage may be largely avoided by increasing the number of pairs of poles in the field-magnet. Multipolar machines for continuous current may have as many as twelve pairs of poles. This form of construction has, moreover, the advantage of enabling material to be more economically arranged, thus securing relatively lighter weight; and, in addition, the speed of rotation may be reduced in inverse proportion to the number of pairs of poles for a given E.M.F. developed. These considerations have established the practice of constructing all machines for more than 150 kilowatt output of the multipolar type, and machines of considerably smaller capacity than this are regularly built with three or four pairs of poles.

In all cases the poles of the field-magnet are fashioned so as to embrace as large a portion of the armature circumference, with as small an air-gap, as may be practicable. To effect this, soft-iron cheeks or pole-pieces are commonly fixed to the shanks which carry the magnetizing coils. Cross-magnetization of the poles due to armature reaction is often prevented by a deep narrow slot across the curved face of each pole-piece, paralleling the direction of the lines of force in the field.

There are several methods of arranging for the magnetization of the fields, which it will be convenient to defer until there has been given some description of the armature and its construction.

The principle underlying this may best be understood by considering what takes place when a single rectangular frame or loop conductor is revolved about the longer diameter in a magnetic field of parallel lines of force. We may imagine the axis or shaft, about which the rectangular frame is rotated, to cross the field at right angles, so that the two long sides of the rectangle parallel to the axis are continually cutting lines of force as the frame revolves. The two short sides do not cross the lines of force at all, but simply slide through them, and have, therefore, no E.M.F. actually induced in them. They serve only to complete the electrical system, so enabling any E.M.F. induced in the active (long) sides to produce a current in the system. The conductor must be imagined as insulated from the shaft.

At the moment when the frame is at right angles to the direction of the field, no lines of force are being cut, and the E.M.F. induced in both active sides, and consequently the current in the system is zero. As, during the course of a quarter revolution (90°) the plane of the frame becomes parallel to the direction of the field, more and more lines of force are cut, and an E.M.F. of continually increasing magnitude is induced in both long sides of the frame.

As the motions of these two active sides during this, and each subsequent 90° of revolution, are in opposite directions with regard to the field, the absolute direction of the E.M.F. induced in one side will be opposite to that induced in the other. However, it will be seen that both induced E.M.F.'s are in the same cyclic direction round the closed frame. The resultant sum of these components will give, therefore, a total E.M.F. and current for this and each 90° of revolution, in a definite direction, depending upon the direction of rotation relative to the polarity of the field.

The maximum value of the induced E.M.F. and current is attained when the plane of the frame lies parallel to the lines of force, and will diminish steadily while remaining in the same direction round the frame until the second 90° is completed, when the total E.M.F. and current again become zero.

During the next two successive 90° arcs of revolution which complete the entire revolution of 360°, the actual direction of rotation of the frame of course remains the same. However, the relative position of the active sides is now reversed, as is also the direction of rotation of each relative to the field. In consequence of this the direction of the resultant induced E.M.F. and current in the frame during the second half of the revolution will be opposite to that during the first half revolution considered. The changes in magnitude from zero to maximum and back to zero take place as before.

The effect of continuous rotation of the frame is therefore to create surges of current in alternate directions for each revolution. The complete change from zero to the maximum in one direction, back to zero, and again through a maximum in the opposite direction, back to zero, is known as a cycle. The rate of alternation is known as the frequency or periodicity, and is measured by the number of cycles per second.

Suppose the form of the rectangular frame conductor to be modified, by leaving one short side open at the middle where the shaft crosses. Let the open ends be led out along the shaft, and each electrically connected to one of two conducting rings mounted side by side on the shaft so as to be insulated from it and from each other. We should then have a very elementary form of alternating current dynamo, or alternator, and by rotating the frame and using collecting brushes pressing on the rings, could lead an alternating current away to an external circuit.

Instead of two collecting rings we can arrange one ring split into two halves, each segment insulated from the other and from the shaft. By connecting the open ends of our rectangular conductor to these two segments, and by using a pair of brushes suitably placed, we can arrange to reverse the segments under each brush simultaneously with the reversal in the direction of current in the conductor. By this means we obtain an elementary direct current dynamo, the split ring constituting the simplest form of commutator.

The practical construction of an armature is based upon the foregoing principle. To build up the induced

E.M.F., insulated conductors are wound in coils about an internal coil of soft iron, which serves to concentrate the lines of force within the coils.

To avoid the loss of power and the heating effect due to eddy-currents induced by the field in the core itself, this must be laminated, or built up on the shaft of the stampings, insulated from one another by shellac. In large machines, the sections are often pierced in addition, so as to form channels, and by means of distance pieces left on the shaft at intervals when assembling, ventilation and dissipation of internal heat are secured.

The simplest form of armature so constructed is the shuttle or Siemens' armature, consisting of a simple coil of many turns. This form has its practical limitations, the principle being the fluctuation of voltage during each revolution when used in a direct-current machine, and the tendency to self-induction which increases very rapidly with the number of turns, when used in an alternator, thus limiting the voltage capacity of the machine.

Both these defects are practically obviated in the drum armature. The core of this is cylindrical, being built of thin insulated discs of charcoal-iron keyed to the shaft. Slots are cut at intervals along the curved face parallel to the axis of the drum, in which are arranged the insulated conductors. This construction allows of a very small air-gap between armature and pole-pieces, which has the effect of reducing the number of conductors necessary for a given capacity. For connecting together the straight segments in the slots, special connecting pieces of thin sheet copper, semi-circular in form, and suitably insulated, are laid side by side round the shaft, the connecting lugs at their ends forming thus a spiral at each end of the commutator. These are necessary to economize space at the ends of the drum, and also to enable individual segments to be conveniently withdrawn, if necessary, for replacement. Each coil is arranged diametrically to the drum, and the whole number is arranged in one series round the armature.

The commutator for such an armature consists of a cylindrical ring, built up of bars of hard-drawn copper insulated from one another by means of mica spacing pieces, and carried on a cast iron sleeve in such a way as to be mechanically stable and insulated from the shaft. The section and length of the bars is determined by the capacity of the machine, and the maximum current density that is found practicable in leading off the current to the brushes. The commutator must have as many segments as there are coils in the armature, and connections to the segments are made in turn at successive junction points of continuous coils in the series.

Brushes are of laminated copper, copper gauze embedded in carbon, or carbon alone. They are carried on rocker arms which allow of some adjustment in position round the commutator circle, this being necessary to avoid sparking at the brushes when the load is varied. The holders for the brushes are designed also so that the brushes may be fed radially to the commutator as they wear away, and individual units withdrawn for replacement.

In the Gramme, or ring armature, the lamine are ring-shaped, and supported on a framework of brass or gun-metal, keyed to the shaft. Round the hollow cylinder thus formed, the coils are wound, the return winding being passed through the inside of the cylinder, all coils being in series and connected to the commutator segments as in the drum armature. This form of armature is suitable only for small size machines, being weak mechanically. It is, moreover, harder to wind, and carries a much larger proportion of inactive conductor than in the drum pattern, since only those segments outside the cylinder contribute to the total E.M.F.

The same general principles apply on the whole as to direct-current machines. The manner of connecting contiguous coils on the armature is different, and of course no commutator is required, its place being taken by collecting rings. The absence of the commutator simplifies matters considerably, and in particular enables high voltages to be developed, a matter of considerable economic importance in connection with power transmission over long distances. The necessity of having alternating current of minimum periodicity corresponding to about 60 cycles per second for lighting purposes leads to the adoption of multipolar fields, thus avoiding high rotating speeds. It is quite practicable, and indeed advantageous, to reverse the relative position of armature and field magnets, having the former stationary and the latter revolving, and most modern alternating machines are built in this way.

Regarding the magnetization of the field magnets, alternators are dependent for this purpose on direct-current machines; in some cases these exciters are built on the shaft of the alternator, but it is more convenient to have them independent. Direct-current machines may also be classified as separately excited, in cases where the magnetizing

coils of the fields derive their current from a source external to the machine.

Another method is to lead the current in the external circuit round the field magnets. Such an arrangement constitutes a series dynamo, and in such the building up of the field and the induced E.M.F. depend on the residual magnetism in the field magnets. Series machines are not practicable except when only small deviations from constant load occur.

A shunt-round machine is one in which the field magets are wound with coils arranged as a high resistance shunt in parallel with the external circuit. Machines of this class are much less affected than the series machines, by variations in the external circuit.

By combining both the series and shunt winding on the one machine there is obtained the compound-wound machine, which is practically self-regulating as regards voltage, with all changes in the external load.

DYNAMOMETER, an instrument for measuring the force used in overcoming resistance and producing motion.

DYSENTERY, a febrile, infectious tropical disease, not common in this country. It may be acute or chronic, or again complex, and is very intractable and highly dangerous. It is seated in the large intestine, the lower part of the bowel, but sometimes extends upward into the small intestine above the ileocæcal valve. Dysentery is accompanied by straining, and scanty mucous and bloody stools, containing little or no fæces. The most frequent complication is with the liver and disease of the kidney. There is feverishness throughout, dry skin, furred tongue, thirst, sleeplessness, quick pulse, despondency, etc., slow convalescence, rarely complete, leaving the patient frequently a complete wreck. Ipecacuanha is the chief remedy, especially in the acute cases. In the scorbutic form, the Bael fruit is the best remedy. Dysentery usually commences with griping diarrhœa, and shooting or cutting pains. In favorable cases recovery may take place in from three to four weeks, but death sometimes occurs in 10 or 12 days, or the case may extend over months or years.

DYSPEPSIA, difficulty of digestion. The action of the stomach on the food is that usually designated as digestion, and it is the derangement of this process that is usually expressed by the term dyspepsia. The sub-acute and chronic forms of gastric irritation and inflammation are the most common forms of dyspepsia, and are often caused by too highly seasoned or too abundant food and stimulant drinks. Another class of dyspeptic diseases is connected with irritation of the mucous membrane of the duodenum, causing perversion of secretions and disorder of functions. A third class of dyspeptic diseases depends on the nerves connected with the digestive viscera. Hence arises an order of dyspeptic symptoms independent of any immediate affection of the stomach. The most common causes of dyspepsia are excesses of various kinds, especially in the quantity of food eaten. The quality must also be considered, while good cooking is also a preservative against dyspepsia.

DYTISCUS, a Linnæan genus of aquatic coleopterous insects or water beetles, forming the tribe or family *Dytiscidæ*. They are pentamerous coleoptera; *i.e.*, have all the tarsi five-jointed. Their general form is oval, the outline little broken, and the surface very smooth. The respiratory organs of the perfect insect are not adapted to the extraction of air from water, and it must occasionally come to the surface to breathe, where it rests for a short time back downward, and with the extremity of the abdomen exposed to the air, the openings of the air tubes being in the last segment.

DYVOUR (to owe), in the old legal language of Scotland, a bankrupt who under various acts from 1606 to 1696 was until discharged compelled to wear a hideous and conspicuous costume. Thus an act of 1688 prescribes as the dyvour's habit "a bonnet partly of brown and partly of a yellow color, with uppermost hose, or stockings, on his legs, half brown and half yellow colored, conform to a pattern delivered to the magistrates of Edinburgh." The barbarous usage had fallen into desuetude long ere the dyvour's habit was abolished by law in 1836.

DZIGGETAI, a species of wild ass, more horse-like than the others. It is probably the hemionus ("half-ass") of Herodotus and Pliny. It inhabits the elevated steppes of Tartary, extending into the S. of Siberia and to the borders of India. The dziggetai lives in small herds. The Mongols and Tungûs hunt it eagerly on account of its flesh. It has been partly domesticated. It is also known by the names of kiang, khur, and goor.

E

E, e, the fifth letter and the second vowel in the English language. It has three principal sounds, the first long, and corresponding to the sound of i in French and Italian, as in me; the second short, as in men, set; the third like ā or the French è, as in there. There is also the modification caused by the short or long being followed by r, as in her and here, and the u or dropped sound of it, as in camel. E occurs in words more frequently than any other letter of the English alphabet, this being in a great measure due to the fact that it represents in many instances the Anglo-Saxon a, e, o, and u. It is pronounced with a medium opening of the mouth, the tongue being expanded to touch the upper molars, and the voice gently expirated. E is largely used as a final vowel to lengthen the preceding syllable, being itself silent; as man, mane; can, cane. Sometimes, however, it exercises no influence on the preceding vowel, as in gone, give. It is also used after c and g to denote the softened sound of those letters; c followed by e being pronounced as s, and g followed by e as j. Up to the end of the 14th century the final e was in most cases pronounced, except before a vowel, or letter h; thus the first line of Chaucer's "Canterbury's Tales" was pronounced as follows:

"Whan that Aprille with his shoures swote."

When the letter e is doubled the sound is the same as that of the long single e; as in deem, seem, etc. The digraph ea is, in most cases, sounded as long e, but occasionally as short e; as in lead (the metal), tread, etc. The combination ei has two sounds: the first the same as long e, as in receive, deceive, etc.; the second that of long a, or French è, as in reign, feign, etc. The digraph ie has the sound of long e, as in siege, believe, etc.

E as an initial is used for East, as in charts: E. by S.=East by South.

E as a symbol is used:

1. In numerals, for 250.
2. In chemistry, for the element erbium.
3. In music.

(1) For the note hypate in Greek music.

(2) The key-note of the Church mode, called Phrygian.

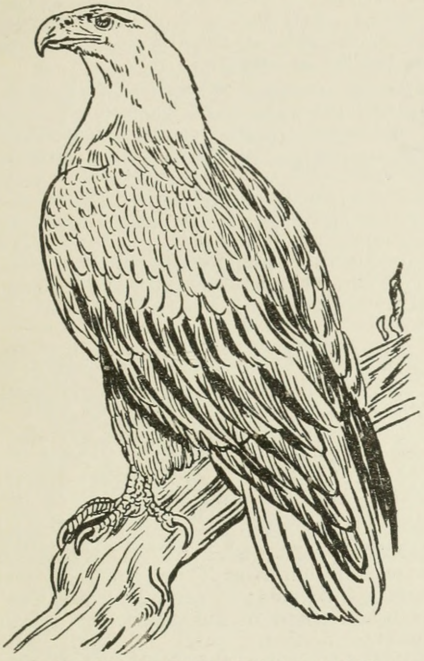
(3) The note elami in the system of hexachords.

(4) The third note of the diatonic scale, corresponding to *mi* of the Italians.

EADS, JAMES BUCHANAN, an American engineer; born in Lawrenceburg, Ind., May 23, 1820. He early designed some useful boats for raising sunken steamers, and in 1861, when called to advise the National Government, constructed within 100 days eight ironclad steamers for use on the Mississippi and its tributaries. He afterward built a number of other ironclads and mortar-boats. His steel arch bridge (1867-1874) across the Mississippi at St. Louis, with its central arch embracing a clear span of 520 feet, ranks deservedly among the notable bridges of the world; his works for improving the South Pass of the Mississippi delta were successfully completed in 1875-1879; and his great plan for deepening the river as far as the mouth of the Ohio by means of jetties, has been demonstrated to be entirely practicable. In 1884 he received the Albert Medal of the Society of Arts, being the first American citizen so honored. He died in Nassau, New Providence, March 8, 1887.

EAGLE, a name given to many birds of prey in the family *Falconidæ* and the order *Accipitres*. The golden eagle, the white-headed eagle and the sea eagles are characteristic examples. The falcon family includes over 300 predaceous birds, feeding for the most part on living animals, hunting by day, and living usually on exposed rocky places.

They are cosmopolitan in distribution. The bill is powerful, but rather short, high at the root, and slightly curved; the partition between the nostrils is complete; the upper margin of the eye-

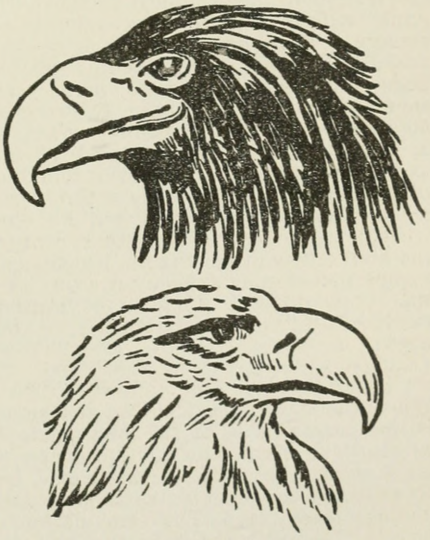


AMERICAN BALD-HEADED EAGLE

socket projects; the head and neck are feathered; the soles of the feet bear large callosities. It is a matter of much difficulty to separate the eagles definitely from the related falcons, buzzards, kites, and hawks.

EAGLE PASS, a city of Texas, the county-seat of Maverick co. It is on the Southern Pacific and the Mexican International railroads, and on the Rio Grande river. It is the center of an important coal mining, agricultural, and stock-raising region, has an extensive trade in cattle, hides, and wool, is a port of entry, and has a large international trade. It has a handsome Federal building. Pop. (1910) 3,536; (1920) 5,765.

EAR, the organ of hearing; is composed of three parts, the external ear, the middle ear, or tympanum, and the internal ear, or labyrinth. The external ear consists of two portions, the auricle or pinna (the part popularly recognized as the ear), and the auditory canal or external meatus. In man, the auricle, on its outer or more exposed surface, presents various eminences and depressions, resulting from the form of its cartilaginous frame-work. The deep, capacious central space to which several grooves converge is termed the concha, and the lowest and pendulous portion of the ear is termed the lobe. The auditory canal passes from the concha inward and a little forward for rather more than an inch. It is narrower at the middle than at either extremity; and on this account there is often considerable difficulty in extracting foreign bodies which have been inserted into it. The membrane of the tympanum or drum which terminates it is placed obliquely, in consequence of the lower surface of the meatus being longer than the upper. The canal is partly cartilaginous and partly osseus; the osseus portion consisting, in the fœtus, of a ring of bone, across which the membrane is stretched, and in many animals remaining persistently as a separate bone. The orifice of the meatus is concealed by a pointed process, which projects from the facial direction over it like a valve, and which is called the tragus, probably from sometimes being covered with bristly hair like that of a goat (tragus); and it is further defended by an abundance of ceruminous glands, which furnish an adhesive, yellow, and bitter secretion, the cerumen or wax, which entangles small insects,



EAGLE
Top—Harpy Eagle Bottom—Kite

particles of dust, and other small foreign bodies, and prevents their farther passage into the meatus.

The middle ear, or cavity of the tympanum, is a space filled with air which is received from the pharynx through

the Eustachian tube and traversed by a chain of very small movable bones, which connect the membrane of the tympanum with the external ear. It lies, as its name implies, between the external meatus and the labyrinth or internal ear, and opens posteriorly into the cells contained in the mastoid portion of the temporal bone, and anteriorly into the Eustachian tube. The cavity is of an irregular shape, and is lined by a very delicate ciliated epithelium, which is a prolongation of that of the pharynx through the Eustachian tube. Its external wall is in great part formed by the membrane of the tympanum, which is nearly oval, and placed in a direction slanting inward, so as to form an angle of about 45° with the floor of the auditory canal.

The Eustachian tube, into which the tympanic cavity opens anteriorly, is about an inch and a half in length, and passes downward, forward, and into its opening in the pharynx. It is partly osseus but chiefly cartilaginous, and allows the free passage of air in and out of the tympanum.

The internal ear or labyrinth is the essential part of the organ of hearing, being the portion to which the ultimate filaments of the auditory nerve are distributed. It is composed of three parts: the vestibule, the semi-circular canals, and the cochlea, which form a series of cavities presenting a very complicated arrangement, and lying imbedded in the hardest part of the petrous portion of the temporal bone. They communicate externally with the tympanum through the fenestra ovalis, and the fenestra rotunda; and internally with the internal auditory canal, which conveys the auditory nerve from the cranial cavity to the internal ear. The very dense bone immediately bounding these cavities is termed the osseous labyrinth, to distinguish it from the membranous labyrinth, which lies within a portion of it. The cochlea, so-called from its resemblance to a common snail-shell, consists of an osseous and gradually tapering canal, about an inch and a half in length, which makes two turns and a half spirally around a central axis, termed the modiolus, which is perforated at its base for the entrance of the filaments of the cochlear portion of the auditory nerve. This spiral canal gradually diminishes toward the apex of the cochlea. At its base it presents an opening into the vestibule, partially divided into two. In the infant state, one of these openings (scala tympani) does not communicate with the vestibule, but is closed by the membrane of the fenestra rotunda. Its interior is sub-divided into two passages (scalæ) by an osseous lamina. This is the lamina spiralis, which incompletely divides the cochlea into an upper passage, the scala vestibuli, and a lower one, the scala tympani—that is, the division is incomplete so far as the skeleton goes, but is completed during life by the lamina spiralis membranacea (or basilar membrane).

EARL, a degree of the British nobility between marquis and viscount, the title of highest antiquity in England. The title was made hereditary by William the Conqueror, and for a time was used interchangeably with that of count, the corresponding title on the Continent. The wife of an earl is still called a countess. An earl's coronet is composed of eight pearls raised upon points, with small leaves between, above the rim.

EARLE, MRS. ALICE MORSE, an American writer; born in Worcester, Mass., April 27, 1853. She has written extensively upon the manners and customs of the colonial period in New England and New York. Among her numerous works are: "Curious Punishments of Bygone Days," "Customs and Fashions in Old New England," "Colonial Dames and Goodwives," "Colonial Days in Old New York," "Sun Dials and Roses of Yesterday" (1902); "Two Centuries of Costume in America" (1903). She died in 1911.

EARLHAM COLLEGE, an institution for higher education, founded under the auspices of the Orthodox Friends at Richmond, Ind., in 1859. The college is coeducational. There were in 1919 400 students and 25 instructors. President, D. M. Edwards.

EARLY, JUBAL ANDERSON, an American military officer; born in Franklin co., Va., Nov. 3, 1816; graduated at West Point, and served in the Florida and Mexican wars. During most of the years 1838-1861, however, he practiced law in his native State. On the outbreak of the Civil War he entered the Confederate service as a colonel, and commanded a brigade at Bull Run, and a division at Fredericksburg and Gettysburg. In 1864, after some successes, he was defeated by Sheridan in several battles; and, Custer having also routed him at Waynesboro in March, 1865, he was relieved of his command a few days later. He subsequently returned to the practice of law. In 1867 he published "A Memoir of the Last Year of the War for Independence in the Confederate States." He died March 2, 1894.

EARTH, the name applied to the third planet in order from the sun. To

the eye it appears as if the earth was in the center of the universe, the sun and the stars revolving round it. The phenomena are much better accounted for by supposing the apparent revolution of the celestial vault to be produced by an actual rotation of the earth on its axis in about 24 hours, producing day and night.

In possessing a satellite (the moon) the earth resembles various other planets, except that they have more attendant bodies than one. In fact, the earth is a planet, and, like other planets, its figure is not far from spherical, as is proved by its having been sailed round. Magellan led the way, having circumnavigated a great part of the globe between 1519 and 1521, being killed in the Philippine Islands in the last-named year. Sebastian del Cano, one of his officers, completed the enterprise. Sir Francis Drake returned alive from a similar enterprise successfully carried out between 1577 and 1579 or 1580.

The sight of the masts of a vessel appearing before the hull comes in sight is a proof that at least that portion of the world visible to us is a curve. Moreover, in an eclipse of the moon the shadow of the earth obscuring the face of the luminary is found to be circular, and there are other arguments in the same direction. Only in a broad sense can the earth be described as spherical; it is really an oblate spheroid— *i. e.*, the distance between the two poles is less than that between two extremities of a diameter drawn through the equator. This form may have been produced by the rotation of a partially fluid sphere. According to Bessel, the greater or equatorial diameter is 7,925.604 miles, the lesser or polar one 7,899.114 miles; the difference of diameter, or polar compression, is 26.471 miles, and the proportion of the equatorial to the polar diameter as 299.15 to 298.15. The dimensions given by Sir R. Airy slightly differ from these. The force of gravity at the poles is to that at the equator very nearly as 180 to 179.

It is not of uniform density, the French mathematician, Clairvault, assuming it to consist of ellipsoidal strata increasing in density as they approached the earth's center, and, taking it for granted also that the attractive force might be calculated on the law of liquids, proved that the amount of gravity at the poles to that at the equator is as 180 to 179, and that the earth's polar axis was to its equatorial one as 299 to 300, which almost exactly agrees with the result of observation. Clairvault believed the mean density of the earth, taken as a whole, to be about twice that of the parts near the surface. Henry Cavendish, Dr. Reich, and Francis Baily considered the density of the earth to be 5.67, and Sir R. Airy believed it 6.565, that of water being 1. The number of cubic miles in the earth is about 259,800,000,000, each cubic mile containing 147,200,000,000 cubic feet.

The surface of the land is to that of the water on the earth in the proportion of one to three. The land is unequally distributed, most of it being in the N. hemisphere.

The universal opinion of geologists is that the earth is of immeasurable antiquity. The old view that our planet is but a few thousand years old now exists only among the uninformed. It is not yet proved that astronomical changes have ever taken place since the first establishment of the solar system seriously to modify the state of things existing on the earth.

The action of the earth on magnetic substances is like that of a magnet, and it has two poles different from the ordinary poles.

EARTH, originally, in the opinion of the ancient chemists, or alchemists, one of the four elements, of which all material things in the world were held to be composed, the others being fire, air, and water. Not even one of the four is really a simple substance.

Later, a name given to various substances, opaque, insipid to the taste, incombustible, and, when dry, friable, *i. e.*, easily separated into particles. Five divisions of them were recognized: (a) Boles, (b) Clays, (c) Marls, (d) Ochers, and (e) Tripolis. Under these categories were ranked the oxides of the metals, cerium, aluminium, beryllium, zirconium, yttrium, erbium, thorium, etc. These oxides are insoluble in water, and are all very rare except aluminum. They are difficult to separate from each other, occurring together in rare minerals, and hence the number of metals belonging to this class is not known.

EARTHQUAKE, the term applied to any tremor or vibration of the ground produced by subterranean causes. Many earthquakes are so gentle as to pass almost unrecognized, others excite general alarm without causing damage, while some spread destruction over wide areas. Probably no part of the earth's surface is wholly free from vibration, but destructive earthquakes are confined to comparatively limited regions. The almost universal succession of phenomena recorded in the case of notable earthquakes is first a trembling or vibration, next a severe shock, or several in quick succession and then a vibration which gradually but rapidly becomes insensib..

In most cases each shock lasts only a few seconds, but the vibrations that follow may be continued for days, weeks, or even months. Noises of various kinds usually precede, accompany, or succeed an earthquake. Some of these have seemed to those who have heard them to resemble the howling of a storm, the growling of thunder, the clanking and clashing of iron chains, the rumbling of heavy wagons along a road, or the shattering of enormous masses of glass. Such noises are transmitted through the ground, the sea, or the air.

Some earthquakes are not attended by subterranean sounds. At the time of the terrible shock which destroyed Riobamba in Ecuador on Feb. 4, 1797, a complete silence reigned. Subterranean sounds may be heard without any earth-tremor being perceived. Earthquakes are felt either as vertical shocks, from below upward, as horizontal or lateral shocks, or as undulatory movements. At the time of the great earthquake of Riobamba, the bodies of many of the inhabitants were projected across the river and fell upon La Culla, a hill more than 300 feet high. During the Calabrian earthquake of 1783, the undulatory movement was well marked by the motion of the trees, which swayed to and fro, their branches touching the ground. The same appearance was noted at New Madrid, Mo., during the earthquake of 1811-1812, where the trees bent as the earth-waves passed under them, immediatly afterward recovering their position.

Observations of this kind have led physicists to the belief that an earthquake is a wave or true undulation of the crust. The wave produced by the original impulse travels outward in all directions from the "focal cavity," or "centrum," in successive spherical shells. The point or area on the surface of the ground directly above the "origin" or centrum, is called the "epicentrum"; it is at this point that the shock is usually felt as a vertical stroke coming from below upward. As we recede from this point, the direction of motion becomes more and more nearly horizontal, and also gradually decreases in intensity till it becomes insensible. Away from the epicentrum, the earth-wave at every point comes up obliquely from below—the radial lines along which an earthquake is propagated from the centrum being called "wave-paths." The direction of motion is also influenced by the configuration or varying topographic features of the disturbed district.

Most earthquakes occur during the cold months or in winter, at which time barometric fluctuations are most numerous. Among memorable earthquakes may be noted that of Lisbon, Nov. 1, 1755, destroying 60,000 lives, which left the city in a heap of ruins, and was felt from the Madeiras to Great Britain; and that which destroyed Aleppo in 1822.

Within the United States only five great earthquakes are known to have occurred since the first settlement.

The earliest occurred in the year 1755, in Massachusetts, which, though very forcible, was much less so than the other four, but the information about it is scanty. The second, the most energetic of all, was that of New Madrid, Mo., in 1811, folowed by many forcible shocks in subsequent months and years. The third was in the Inyo Valley of California in 1868; and the fourth at Charleston in 1886, which was from 107 to 120 kilometers deep and was felt at a distance of 1,000 miles. The fifth was the San Francisco earthquake of 1906, given below.

The severe and destructive earthquakes since the Christian era are as follows:

A. D. 79. Destruction of Herculaneum and Pompeii. Destruction of life very great, including Pliny the Elder.
A. D. 526. Around the Mediterranean. Estimated fatality, 120,000 people.
Dec. 18, 1631. Naples. Fatality, 3,000 people.
June 7, 1692. Port Royal. Fatality, 3,000 people.
A. D. 1693. Sicily. Destruction of Catania, 300 villages and 60,000 people.
Oct. 28, 1724. Lima and Callao. 18,000 people destroyed.
Nov. 1, 1755. Lisbon. Fatality, 60,000. It was felt over a twelfth of the earth's surface.
Feb. 5, 1783. Calabria generally. 30,000 people.
Feb. 4, 1797. Riobamba, Quito, Cuzca. 40,000 people.
March 26, 1812. Caracas. More than 20,000 people.
Jan. 11, 1839. Martinique. 300 people.
Aug. 13, 1868. Peru and Ecuador. Especially at Arica, 70,000 people destroyed and $300,000,000 worth of property.
April 3, 1880. Chios. 14,000 dwellings and 3,541 people.
July 28, 1883. Ischia. 2,400 people.
Aug. 27, 1883. The Krakatoa destruction was peculiarly volcanic, not seismic. It destroyed about 35,000 people by a tidal wave.
Aug. 31, 1886. Charleston earthquake described above.
Oct. 28, 1891. Central Japan (Owari-Mino). Destroyed 7,000 people, 200,000 dwellings, and $22,500,000 worth of property.
Feb., 1902. Caucasus. 4,000 people.
May 8, 1902. Guatemala. Was very fatal, but numbers unknown. It was simultaneous with the outbreak of Mt. Pelée on Martinique which destroyed St. Pierre and was fatal to 20,000 people.
April 18, 1906. San Francisco Bay. Destroyed San Francisco and Santa Rosa, uncounted buildings, about 800 lives and more than (est.) $300,000,000 worth of property.
Dec. 28, 1908. Messina. Destroyed the city and caused the death of 200,000 people, the worst earthquake disaster in history.
May 5, 1910. Cartage, Costa Rica, destroyed.
Oct. 11, 1918. Porto Rico, loss of 150 lives and property valued at $1,000,000.

EASLEY, RALPH MONTGOMERY, an American economist; born in Schuyler

co., Ill., in 1858. He was educated in the public schools of Quincy, Ill., and for several years taught at the public schools. After several years of newspaper work he organized and became secretary of the Civic Federation of Chicago. In 1900 he organized the National Civic Federation and became chairman of its executive council. He promoted national conferences on primary election reforms in New York and promoted also other conferences on political and economic subjects. He organized in 1917 the League for National Unity. He wrote extensively on sociological subjects.

EAST AFRICA, GERMAN, former German possessions in East Africa, acquired in 1885-1890, lying immediately to the S. of British East Africa, and having an estimated area of about 400,000 square miles, and estimated population of 7,659,898. They are bounded on the N. by a line running N. W. from the Umba river to the E. shore of the Victoria Nyanza, and continuing W. from this lake to the Kongo state. Lake Tanganyika forms the W. boundary, and thence a line to Lake Nyassa and the river Rovuma form the S. W. and S. boundaries. In September, 1894, it was agreed that the German-Portuguese frontier should follow parallel 10° 40′ S. lat. from the coast to its intersection with the river Rovuma, leaving Kionga and the mouth of the Rovuma to Germany, and Cape Delgado to Portugal. Several stations have been established by the German East Africa Company, and the chief ports are Dar-es-Salaam, Bagamoyo, Kiloa, and Tanga. The products of the country are coffee, tobacco, cotton, ivory, caoutchouc, and gum. The conquest of German East Africa, in the course of the World War (1914-1918), was completed by British forces in 1918, and by the terms of the Peace Treaty of 1919 the territory is divided between Great Britain and Belgium. The British part has been named "Tanganyika" territory. Government seat, Dar-es-Salaam.

EAST AFRICA, PORTUGUESE, possessions of Portugal. It comprises the province of Mozambique, capital Laurenço Marques; and Companhia de Mozambique; and Companhia de Nyassa. Total area, 428,132 square miles. Pop. about 3,000,000 (1,050 whites, 1,100 Asiatics, etc.). Its coast-line extends S. from Cape Delgado, the S. extremity of the coast-line of German East Africa to Kosi Bay, just below Delagoa Bay, at a point separating British from Portuguese territory, as fixed by the Anglo-Portuguese agreement of 1891; the N. boundary is the river Rovuma, running W. from Cape Delgado to Lake Nyassa. The frontier between German and Portuguese East Africa (until 1914) ran along parallel 10° 40′ S. lat. from the coast to its intersection with the river Rovuma, leaving the mouth of the Rovuma and Kionga to Germany, and Cape Delgado to Portugal. By the terms of the Treaty of Versailles in 1919, to Portugal was allotted the territory south of Rovuma known as "Kronya Triangle," formerly belonging to German East Africa. The E. boundary is the lake and British Central Africa, or the Nyassa Protectorate down to the junction of the Shiré with the Zambesi; while from that point the British South Africa Company's territory, including Mashonaland and Matabeleland, and the former South African Republic, form the boundary.

EAST AFRICA PROTECTORATE, now **KENYA COLONY**, British possessions in East Africa, extending about 400 miles along the coast N. from Umba, at the mouth of the Umba river. The S. boundary runs from Umba in a N. W. direction to the intersection of the Victoria Nyanza while the 1st parallel of N. lat., skirts the N. shore of the lake, and thence W. to the boundary of the Kongo Free State. The river Juba begins the N. boundary, which from the intersection of the river with the 6th parallel N. lat. runs to the 35th meridian E. lon., and follows that to its intersection with the Blue Nile; the Kongo Free State and the W. water shed of the basin of the Upper Nile forming the W. boundary. The total area is 246,822 square miles, embracing a great part of Somaliland, the Equatorial province, Uganda, Usoga, Unyoro, etc. The population is estimated at 2,807,000, of which 5,362 are Europeans. The Imperial British East Africa Company opened up the country, having in 1888 obtained a concession of territory from the Sultan of Zanzibar and a charter from the British Government. An arrangement for buying them out was, however, made in 1895. The chief ports are Mombassa, the capital (pop. 30,000), Lamu, Umba, and Kismayu. In 1905 it was ordained that the Legislative Council should consist of 11 elected representatives of European countries: 3 nominated, 2 natives and 1 Arab. In 1920 British East Africa was annexed to the British Crown under the name of Kenya Colony.

EAST ANGLIA. See ANGLIA, EAST.

EASTBOURNE, a favorite English watering place, especially for the wealthier classes, in the Rape of Pevensey, midway between Brighton and Hastings, and 66 miles S. of London. Pop. (1918) 48,784.

EAST CAPE, the name of the S. E. extremity of New Guinea, in Goschen Strait, and of the most easterly headlands of Madagascar, the North Island of New Zealand, and Siberia. The last, on Bering Strait, and in lon. 169° 38′ W., is the E. extremity of Asia, and is a bold, rocky promontory of syenite, almost cut off from the mainland by swamps and shallow lakes. On the N. side is a village, Uédle, of less than 100 huts, with a population of about 260.

EAST CHICAGO, a city of Indiana, in Lake co. It is on the Pennsylvania, the Wabash, the Pere Marquette, the Baltimore and Ohio, Chicago Terminal, and other railroads. It is on Lake Michigan and has excellent shipping facilities, which have been improved by the construction of a canal connecting the harbor with Calumet river. The chief industries are the manufacturing of iron and steel, cement, boilers, chemicals, and foundry products. Pop. (1910) 19,098; (1920) 35,967.

EAST CLEVELAND, a city of Ohio, in Cuyahoga co. It is a residential suburb of Cleveland. The city contains the laboratories of the National Electric Lamp Association. Pop. (1910) 9,179; (1920) 27,292.

EAST CONEMAUGH, a borough of Pennsylvania, in Cambria co. It is on the Pennsylvania railroad, and on the Conemaugh river. Its principal industry is the manufacture of steel. It also has railway shops. In 1889 the borough was partially destroyed by the Johnstown flood. Pop. (1910) 5,046; (1920) 5,256.

EASTER, the appellation given, with some small variation in the several languages and dialects, by the nations of Teutonic descent, to the festival kept in commemoration of our Saviour's resurrection. The Latin nations called the same feast by words derived from Lat. *Pascha;* Gr. *Pascha;* and remotely from the Hebrew *Pesachh*, meaning the Passover, whence the French *Pâque* (O. Fr. *Pask* and *Pasque*); in Spanish, *Pascua;* in Port. *Pascos;* and in Italian *Pasqua.* From the same source, also, the word *Pasche* has been introduced into Anglo-Saxon. Thus no distinctively Christian name exists for the resurrection festival, one of the two being of ethnic and the other of Jewish origin.

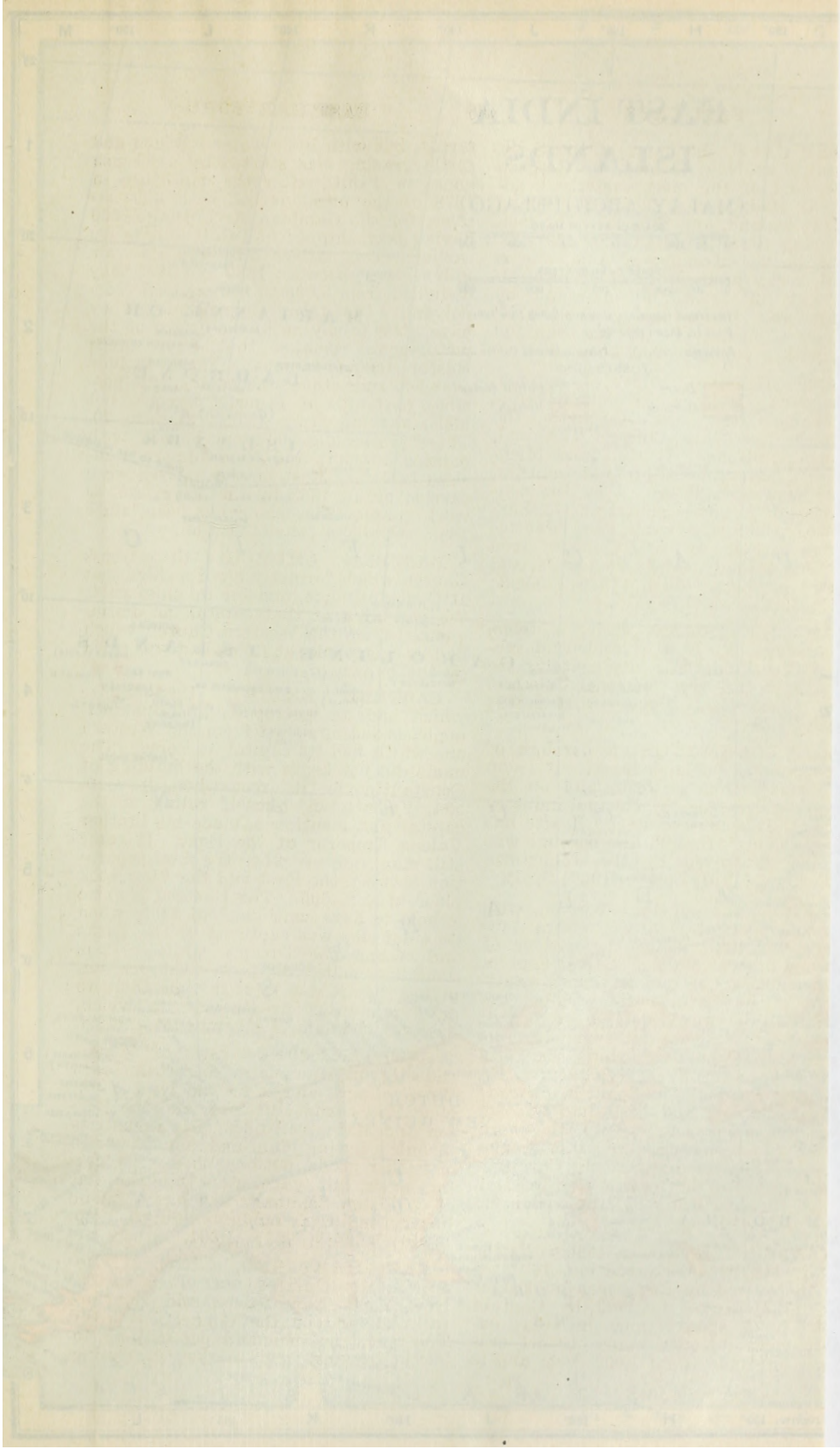
EASTER ISLAND, a lonely Pacific islet in lat. 27° 8′ S., and lon. 109° 24′ W.; discovered by Roggeveen on Easter day, 1722, visited in 1773 by Captain Cook; is 47 square miles in area; entirely volcanic, with many extinct craters rising more than 1,000 feet; and is fertile, but with little water. Sheep and cattle grazing was started by a French house in Tahiti, after the departure in 1878 of the missionaries, with 300 natives, for the Gambian Archipelago, 500 having been shipped to Tahiti four years earlier. The natives still left are fair Polynesians; between 1860 and 1882 they dwindled from 3,000 to 150, as well from polyandry as from emigration. They have little to say as to the origin of the picturesque remains that have made Easter Island famous. These include over 500 rude stone statues or busts, possibly portraits of famous persons, not idols, varying from 3 feet high to 70. There are besides 100 stone houses, with painted interiors and (undeciphered) incised tablets. Most of the natives were carried off in 1863 by the Peruvians to work guano. The island has been, since 1888, a Chilean convict station.

EASTERN CHURCH, the Greek Church which formerly had its chief seat at Constantinople, and for its chief ruler the patriarch of that capital, as distinguished from the Western Church which had its metropolis at Rome and was ruled by the papacy.

EASTERN EMPIRE, the empire which had its metropolis at Constantinople, as distinguished from the Western one which had its capital at Rome. The name did not begin with the building of Constantinople; it arose when, in A. D. 394, Valentinian, himself ruling at the capital just mentioned, made his brother Valens Emperor of the East. It came still more into use when the final separation between the East and the West took place in A. D. 395. The Eastern Empire is held to have continued till 1453, when its chief city was captured by the Turks and became the Turkish capital. It is sometimes called the Lower Empire, implying that it was later in time than its more celebrated predecessor, to which, however, the name Higher is not applied.

EASTHAMPTON, a town of Massachusetts, in Hampshire co. It includes three villages and is on the New York, New Haven and Hartford, and the Boston and Maine railroads. Its industries include a dyeing plant and manufactories of rubber goods, buttons, shoe webs, cotton goods, felt, yarn, etc. It is the seat of Williston Seminary and has a public library and other public buildings. Pop. (1910) 8,524; (1920) 11,261.

EAST HARTFORD, a town of Connecticut, in Hartford co. It is on the New York, New Haven and Hartford railroad, and on the Connecticut river. The industries include paper making, tobacco growing, and market gardening.




EAST INDIA
ISLANDS
(MALAY ARCHIPELAGO)
SCALE OF STATUTE MILES
SCALE OF KILOMETERS
Important towns are shown in heavy face type
Capitals shown thus ⊛
Railways
Telegraphs and Cables
POSSESSIONS
Dutch
German
United States
British
Portuguese
MARIANNE OR
LADRONE
ISLANDS
CAROLINE ISLANDS
PACIFIC
OCEAN
INDIAN
OCEAN
CELEBES SEA
SULU SEA
JAVA SEA
BANDA SEA
ARAFURA SEA
CORAL SEA
MELANESIA
BORNEO
CELEBES
SUMATRA
JAVA
TIMOR
AMBOINA
DUTCH
NEW GUINEA
BRITISH
NEW GUINEA
GULF OF
PAPUA
PHILIPPINE
ISLANDS
MANILA
SINGAPORE
BATAVIA
PENANG
SAMARANG
SOERABAYA
MACASSAR
MENADO
TERNATE
AMBOINA
DILOLO
(PORTUGUESE)
PELEW IS.
(GERMAN)
CAROLINE IS.
(GERMAN)
Copyright, L. L. Poates Eng. Co., 1913
Long E 120° East F from 125° G Greenw. 130°

There are also railroad and machine shops. The town has a public library and the Raymond Library. Pop. (1910) 8,138; (1920) 11,648.

EAST INDIA COMPANY, in its original form "The Governor and Company of Merchants of London trading to the East Indies"; so the company is described in its charter, dated Dec. 31, 1600. Afterward, on July 22, 1702, "The United Company of Merchants trading to the East Indies." In 1749 the company plunged into the native wars of the Carnatic, and commenced a career of conquest which placed nearly the whole of India either directly or indirectly under the British rule. The victory of Clive, at Plassy (June 23, 1757), over Suraj-u Dowla laid the foundations of the Anglo-Indian empire.

The rise of such power excited in the home government a desire to reduce it under their control; and when as early as 1769 the company wished the loan of two ships of the line and some frigates, the ministry in granting their request intimated their intention of vesting in the admiral power to treat independently on all maritime affairs. In 1773 the home government claimed that the territorial acquisitions of the company should be transferred after six years' grace to the crown, and change made in the constitution of the company, a Supreme Court of Judicature being also appointed in India. Pitt's act (1784) established a board of control over the directors, which completely destroyed the independence of the latter body. The company's charter was renewed with a few changes in 1793; subsequently at intervals of 20 years. In 1813 they lost the monopoly of the Indian trade, retaining that of China. This last was taken away in 1833. The next renewal, that of 1853, was the last that took place. The Indian mutinies of 1857 and 1858, having discredited the company's administration, its political government was brought to an end on Aug. 13, 1858.

On Nov. 1, 1858, a proclamation made at Calcutta announced that Queen Victoria herself assumed the government of India. Finally the East India Stock Redemption Act, passed on May 13, 1873, but not operative till June 1, 1874, at the latter date, dissolved the company itself.

EAST INDIES, the name given to India, the Eastern Peninsula and the islands of the adjacent archipelago stopping in the one direction short of the Philippine Islands, and in the other before reaching New Guinea.

EASTLAKE, SIR CHARLES LOCK, an English artist, and critic and historian of art; born in Plymouth, Nov. 17. 1793. His paintings were noteworthy; and in such books as "Materials for a History of Oil Painting" (1847-1869) and "History of the Gothic Revival" (1871), he manifested taste and discrimination. He died in Pisa, Italy, Dec. 14, 1865.

EAST LIVERPOOL, a city in Columbiana co., O.; on the Ohio river, and on the Pennsylvania and the Youngstown and Ohio railroads, 45 miles W. of Pittsburgh. It has freight packet connections with all important Ohio river ports, extensive china, porcelain, earthenware, terra cotta and glass works, foundries and machine shops. There are electric street railways and lights, public library, water works, business college, 3 National banks, and several newspapers. Pop. (1910) 20,387; (1920) 21,411.

EASTMAN, CHARLES ALEXANDER (OHIYESA), an American physician, born at Redwood Falls, Minn., in 1858. He was the son of Sioux Indians. He graduated from Dartmouth College in 1887, and after studying medicine became Government physician at the Pine Ridge Agency, serving until 1893. He was Indian secretary of the Y. M. C. A. from 1894 to 1897, and was in charge of the field work of that organization among the Indians. From 1897 to 1900 he was attorney for the Santee Sioux Indians at Washington, and from 1903 to 1909 held an appointment to revise Sioux family names. He married in 1891 Elaine Goodale, poet. He wrote several books on Indian life and customs. These include "Indian Boyhood" (1902); "Old Indian Days" (1907); "The Soul of the Indian" (1911); "The Indian To-day" (1915); "Indian Heroes and Great Chieftains" (1918). He also lectured on Indian life and history.

EASTMAN, ELAINE GOODALE, an American writer; born at Mt. Washington, Mass., in 1863. She was educated privately. She early began writing verse which attracted considerable notice. From 1883 to 1891 she was a teacher and supervisor of Indian schools. In the latter year she married Charles A. Eastman. Her writings, chiefly poetry, include "Apple Blossoms" (1878); "Little Brother o' Dreams" (1910); "Indian Legends Re-told" (1919). She was a frequent contributor to papers and magazines on Indian subjects.

EAST MOLINE, a city of Illinois, in Rock Island co. It is on the Chicago, Milwaukee and St. Paul, the Chicago, Rock Island and Pacific, the Davenport, Rock Island and Northwestern, and the Chicago, Burlington and Quincy railroads. It is an important industrial city and has manufactures of automobiles,

agricultural implements, gas engines, scales, iron goods, cement blocks, etc. Pop. (1910) 2,665; (1920) 8,675.

EASTON, a town of Massachusetts, in Bristol co. It is on the New York, New Haven and Hartford railroad. It includes several villages. There are important manufactures of shovels, foundry products, hardware, wire goods, automobiles, etc. The city has a public library and a number of fine buildings, gifts of the Ames family. Pop. (1910) 5,139; (1920) 5,041.

EASTON, a city and county-seat of Northampton co., Pa.; on the Delaware and Lehigh rivers; the Delaware, Morris, and Lehigh canals; the Lehigh Valley, the Pennsylvania, Lehigh and Hudson River and the Lackawanna railroads; 67 miles N. of Philadelphia. It has extensive water power and shipping facilities, and contains the shops of the Lehigh Valley railroad, railway supply, chemical, hosiery, machine pumps, stores, blast furnaces, woolen goods, and other manufactories. The city has electric and gas lighting plants, electric street railroads, connecting with Bethlehem and Allentown, 3 National and several private banks, high school, public library, old ladies' and children's home, daily and weekly newspapers, and is the seat of LAFAYETTE COLLEGE (*q. v.*). Pop. (1910) 28,523; (1920) 33,813.

EAST ORANGE, a city in Essex co., N. J., on the Lackawanna and Erie railroads, 12 miles W. of New York. It is a place of residence for people doing business in New York and Newark. The streets are well paved and lighted by gas and electricity and afford more than 60 miles of macadam road. The city contains many handsome churches, and private residences, public library, and high and graded schools. It was chartered in 1899. Pop. (1910) 34,371; (1920) 50,710.

EAST PALESTINE, a village of Ohio, in Columbiana co. It is on the Pittsburgh, Fort Wayne and Chicago railroad. The industries include the manufacture of pottery, terra cotta, and tile. It has also machine shops, and a rubber factory. There are important coal mines in the vicinity. Pop. (1910) 3,537; (1920) 5,750.

EAST PITTSBURGH, a borough in Pennsylvania, in Allegheny co. It is on the Pennsylvania, the Bessemer and Lake Erie, and the Union railroads. The city contains factories of the Westinghouse electric and machine companies, and there are also manufactures of meters, machines, steel rails, and furnaces. Pop. (1910) 5,615; (1920) 6,527.

EAST POINT, a city of Georgia, in Fulton co. It is on the Central of Georgia and the Atlantic and West Point railroads. Its industries include oil mills, fertilizer factories, saw and planing mills, iron works, cotton mills, etc. Pop. (1910) 3,682; (1920) 5,241.

EASTPORT, a city and port of entry in Washington co., Me., on Moose Island, in Passamaquoddy Bay, into which empties the St. Croix river, the national boundary between the United States and British America; and on the Washington County railroad; 190 miles E. N. E. of Portland. It is the N. E. frontier city of the United States, and has a fine harbor, with daily steamship service with Boston, Calais, and Portland. The city has extensive fishing and shipbuilding interests, a sardine packing establishment with 20 factories, public high school and library, banks and weekly newspapers. Pop. (1910) 4,961; (1920) 4,494.

EAST PROVIDENCE, a town of Rhode Island, in Providence co. It is on the New York, New Haven and Hartford railroad, and on the Seekonk river, which separates it from Providence. Its industries include chemical, electrical, and wire works. Pop. (1910) 15,808; (1920) 21,793.

EAST RIVER, the strait between Long Island Sound and New York harbor, separating the boroughs of Manhattan and Brooklyn. It is about 12 miles long, varies from one-half a mile to 3½ miles in width, and is navigable by the largest ships.

EAST RUTHERFORD, a borough of New Jersey, in Bergen co. It is on the Erie railroad. It is chiefly a residential city for New York business men, and has cotton and linen bleaching works. It contains a mirror and a steam boiler factory. Pop. (1910) 4,275; (1920) 5,463.

EAST ST. LOUIS, a city in St. Clair co. Ill., on the Mississippi river, opposite St. Louis, Mo., and on the Baltimore and Ohio, Illinois Central, Burlington and Quincy, and seventeen other railroads. It is connected by a steel bridge with St. Louis, Mo., and has excellent passenger and freight steamer service with all leading river ports. The city contains the St. Louis National Stockyards, one of the largest in the United States; has rolling mills, glass works, machine shops, grain elevators, manufactories of pneumatic tools, baking powder, locomotives, fertilizer and paint, and is the largest horse and mule market in the world. It has 2 National and several private banks, electric street railroads,

electric and gas lighting plants, high schools, a public library, daily and weekly newspapers. Pop. (1910) 58,547; (1920) 66,767.

EAST YOUNGSTOWN, a village of Ohio, in Mahoning co. It is on the Baltimore and Ohio railroad, and on the Mahoning river. Its chief industry is the manufacture of iron. Pop. (1910) 4,972; (1920) 11,237.

EATON, CHARLES AUBREY, an American Baptist clergyman, born in Nova Scotia, Canada, in 1868. He graduated from Acadia University in 1890, and the Newton Theological Institution in 1893. In the same year he was ordained to the Baptist ministry and was pastor of the First Church at Natick, Mass.; Toronto, Can.; and Cleveland, O., until 1909, when he became pastor of the Madison Avenue Church of New York. He resigned this position in 1919 to become associate editor of "Leslie's Weekly." At the same time he engaged in the work of an expert in industrial relations. From 1917 to 1919 he was head of the national service department of the United States Shipping Board Emergency Fleet Corporation. He was the author of "For Troubled Hearts" (1899); and "The Old Evangel" (1900).

EATON, CHARLES WARREN, an American artist, born at Albany, N. Y., in 1857. He studied at the National Academy of Design and the Art Students' League. He exhibited in London and Paris in 1900. He received a medal at the Charleston Exposition. He received also prizes at other expositions, including the Inness gold medal, from the National Academy of Design in 1904, and a gold medal from the Paris Salon in 1906. He was an associate of the National Academy of Design.

EATON, WALTER PRICHARD, an American writer, born in Malden, Mass., in 1878. He graduated from Harvard University in 1900 and in the same year engaged in newspaper work. He served as dramatic critic on several New York papers, but in 1908 gave up this work to engage in general writing. His books include "The American Stage of Today" (1908); "The Man Who Found Christmas" (1913); "Plays and Players" (1916); "In Berkshire Fields" (1919). He also lectured on dramatic subjects. He was a member of the National Institute of Arts and Letters.

EATON, WYATT, an American artist; born in Phillipsburg, Quebec, May 6, 1849; studied in New York City and abroad. He returned to the United States in 1876 and settled in New York City. He was one of the founders of the Society of American Artists and later served as its secretary and president. His works include portraits of Bryant, Longfellow, Emerson, Whittier, Holmes, etc. He died in Newport, R. I., June 7, 1896.

EAU CLAIRE, a city and county-seat of Eau Claire co., Wis., at the mouth of the Eau Claire river and the head of navigation of the Chippewa river, and on the Chicago and Northwestern, Chicago, Milwaukee and St. Paul, and several other railroads; 85 miles E. of St. Paul. It is the commercial center for northwestern Wisconsin and the outlet of the Chippewa lumber district, with extensive water power. It has a large trade in lumber. There are extensive manufactures of iron and linen goods, furniture, machinery, paper, steel, sashes and doors, and shoes. The city is noted as a summer resort, and has electric railroads and street lights, water works, public library and high school, Sacred Heart Hospital, National and savings banks, and daily and weekly newspapers. Pop. (1910) 18,310; (1920) 20,880.

EAUX BONNES (ō bon), a fashionable watering-place of France, in the department of Basses-Pyrénées, 20 miles S. S. E. of Oloron. It stands in a narrow gorge surrounded by rocks. Eaux Bonnes is much frequented for its hot sulphurous springs, used for bathing. Their temperature does not exceed 91° F. There is also a cold spring here used for drinking. The springs are said to be very valuable for their power of checking incipient consumption, and of curing various affections of the lungs and chest.

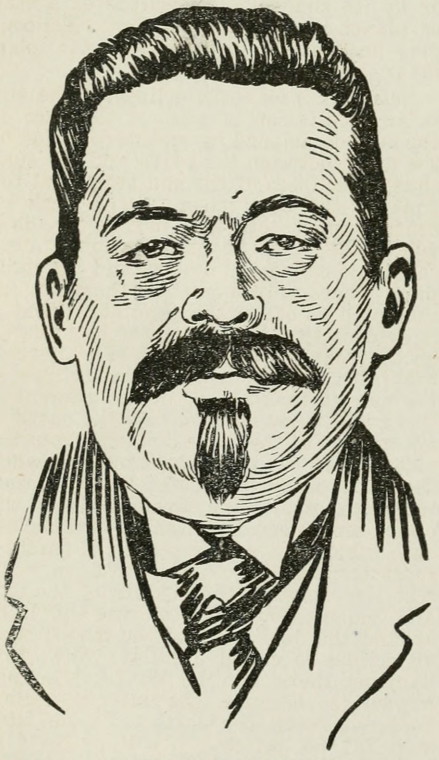
EBBSFLEET, a hamlet in the Isle of Thanet, County Kent, England; memorable as the place where the first Anglo-Saxon invaders landed.

EBENEZER (stone of help), a monument raised by Samuel after his victory over the Philistines, was assumed by early Christian hermits to be at a place now called Deiraban, near the W. border of Judah; but the site is not really known.

EBERS, GEORG MORITZ (ā'bers), a German Egyptologist and novelist; born in Berlin, March 1, 1837; was educated at Froebel's school, and studied law at Göttingen. He afterward devoted himself to the study of Egyptology at Berlin. He established himself in 1865 as a lecturer at Jena, where in 1868 he was made professor. Next year he made a long journey to the East, and

in 1870 was called to Leipzig as Professor of Egyptology. His visit to Egypt resulted in the discovery of the celebrated hieratic medical "Papyrus Ebers" which he published in 1875. His series of historical romances comprise in sequence: "An Egyptian Princess" (1864); "Uarda" (1877); "Homo Sum" (1878); "The Sisters" (1879); "The Emperor" (1880); "Serapis" (1885); "The Bride of the Nile" (1886); "Joshua" (1889); "Per Aspera" (1892); "Cleopatra" (1894); and "Eli fên," in verse (1888). He wrote several other historical novels; including "The Burgomaster's Wife" (1881). He died near Munich, Bavaria, Aug. 8, 1898.

EBERT, FRIEDRICH, President of the German Republic. During his youth he worked first as a harness maker and then as a tailor. He made sufficient money by these trades to purchase a printing establishment in Bremen,



FRIEDRICH EBERT

where he also wrote for the Socialist papers. In 1908 he became a member of the Reichstag, elected there by the Social Democrats. His service as a member of that body was featured by his criticisms of the military budgets and by his conservatism in restraining revolutionary methods. When the war of 1914 came, he with the majority of his party, supported the Government, and even defended the unlimited submarine warfare. In 1916 he was chosen leader of the Socialist group in the Reichstag called the Majority Socialists, as distinguished from the Minority Socialists who opposed the war. He was officially chosen as the national head of the Majority Socialists at the Congress of that party which was held in Würzburg in 1917. Although supporting the Government, Ebert and his group did not fail to criticize it severely and on July 19, 1917, they sponsored the resolution of the Reichstag declaring for peace without annexations and indemnities. Ebert was one of the few prominent Germans who before November, 1918, realized the imminent defeat of the German arms. As early as July of that year he had demanded that the war cease. It was this foresight which caused Prince Max, the Imperial German Chancellor, to turn over his office to him, and when after a few days the office was suppressed, Ebert remained as the directing head of the Government in Berlin. The Independent Socialists and the Communists refused, however, to support his government and during 1919 Berlin and many other German cities were the scenes of considerable street fighting. Ebert's government succeeded in quelling the revolt and also in securing the election of a National Assembly to form a constitution for Germany. In March of 1919 he was elected by that body President of the German Republic. Hardly had the Assembly adjourned when the new Government was overthrown in 1920 by a coup d'état engineered by some ex-army officers. Ebert and the other members of his government escaped from Berlin and succeeded in calling a general strike which in a few days compelled the militarists to capitulate. Ebert and the Republican Government resumed sway in Berlin.

EBRO (ā'brō), a river in Spain, which has its source in the province of Santander, about 25 miles S. of the Bay of Biscay, and after a S. E. course of about 500 miles enters the Mediterranean. Its navigation is much interrupted by rapids and shoals, to avoid which a canal about 100 miles long has been constructed nearly parallel to its course.

ECBATANA (ek-bät'a-nä), the chief city or ancient metropolis of Media, the summer residence of the Median and Persian and afterward of the Parthian kings. It was a place of great splendor at an early period. Its site can no

longer be fixed with certainty, though many explorers agree in identifying it with the modern Hamadan.

ECCLESIASTES (-tēz), the title by which the Septuagint translators rendered the Hebrew *Coheleth* (the gatherer of the people), a symbolic name explained by the design of the book and the dramatic position occupied by Solomon in it, one of the canonical books of the Old Testament. According to Jewish tradition it was written by Solomon; but the best modern criticism has decided that its style and language, no less than its thought, belong to a much later date.

ECCLESIASTICUS, the title of a book placed by Protestants and Jews among the apocryphal writings. The author calls himself Jesus the son of Sirach. Originally composed in Aramaic, the book was translated into Greek by the grandson of the original author about the 3d century B. C.

ECHEGARAY, JOSÉ (ā-chā-gar-ā'), a Spanish dramatist; born in Madrid in 1832. He is author of several treatises on mechanics and civil engineering, and was for a time minister of commerce, of public instruction and finance. Since 1874, when the production of "The Avenger's Bride" opened a new and brilliant life for the Spanish stage, he produced over 70 plays rich in imagination, dramatic force, and lyric talent, though with the true Spaniard's love of the horrible. Of his greatest pieces may be named: "The Great Galeoto"; "Madman or Saint"; "Conflict between Two Duties"; "A Merry Life and a Sad Death." The best known of his plays in America is a version of "The Great Galeotto" produced by the Favershams as "The World and His Wife." In 1904 he shared the Nobel prize with Mistral.

ECKMÜHL (ek'mül), a village of Bavaria, circle of Lower Bavaria, on the Gross Laber, 13 miles S. S. E. of Ratisbon, the scene of a sanguinary battle between the French and Austrians on April 22, 1809, in which the latter were defeated.

ECLECTIC SCHOOL OF MEDICINE, that school which believes that one should choose himself the best in medicine and not be confined in his choices by those offered by any one school of medical thought. The idea is an old one, going back to ancient times, that the individual is capable of choosing what medicine is good for him. Those following the eclectic school usually reject the experience of established medical practice. The American Eclectic School of Medicine was really founded by Wooster Beach in 1826 when he established an eclectic college in New York. By 1914 there were four such colleges in the United States and the National Eclectic Medical Association was incorporated under the laws of the State of New York. The American school has investigated the use of native American plants for medicinal purposes, believing that in the order of Nature a cure for the special diseases of a locality has been provided by plant growth in that region. Much valuable information has been gained by the painstaking investigation entered upon by this school. Beach was the author of a book defending this eclectic method, "The American Practice of Medicine" (New York, 1838).

ECLIPSE, an interception or obscuration of the light of the sun, moon or other heavenly body by the intervention of another and non-luminous heavenly body or by its shadow. An eclipse of a star or planet is called occultation. Eclipses may be divided into three classes: solar, lunar, and planetary.

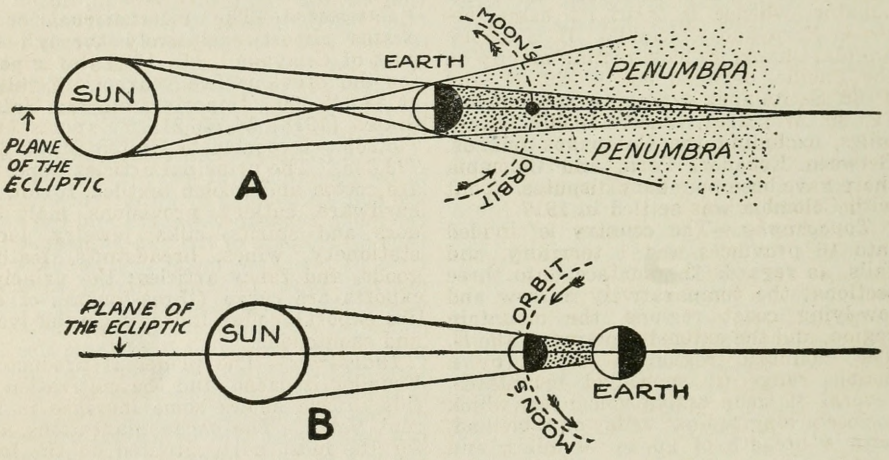
Solar Eclipses.—An eclipse of the sun is an occultation of part of the face of the sun, occasioned by an interposition of the moon between the earth and the sun; thus all eclipses of the sun happen at the time of the new moon. The dark or central part of the moon's shadow, where the sun's rays are wholly intercepted, is called the umbra, and the light part, where only a part of them are intercepted, is called the penumbra; and it is evident that if a spectator be situated on that part of the earth where the umbra falls, there will be a total eclipse of the sun at that place; in the penumbra there will be no eclipse. As the earth is not always at the same distance from the moon, if an eclipse should happen when the earth is so far from the moon that the rays of light proceeding from the upper and lower limbs of the sun across each other before they reach the earth, a spectator situated on the earth in a direct line between the centers of the sun and moon, would see a ring of light around the dark body of the moon; such an eclipse is called annular; when this happens there can be no total eclipse anywhere, because the moon's umbra does not reach the earth. People situated in the penumbra will perceive a partial eclipse; an eclipse can never be annular longer than 12 minutes 24 seconds, nor total longer than 7 minutes 58 seconds; nor can the duration of any eclipse of the sun exceed two hours. An eclipse of the sun begins on the W. side of his disk and ends on the E.; and an eclipse of the moon begins on the eastern

side of her disk and ends on the western. The average number of eclipses in a year is four, two of the sun and two of the moon; and as the sun and moon are as long below the horizon of any particular place as they are above it, the average number of visible eclipses in a year is two, one of the sun and one of the moon. Total eclipses of the sun offer brief but intensely interesting phenomena for the astronomer's study. The nature of the sun's corona is as yet undetermined, and the aid of the spectroscope and of photography has not been sufficiently applied to the settling of the various problems presented. There were solar eclipses May 18, 1901, Aug. 30, 1905, Aug. 21, 1914, June 8, 1918, May 29, 1919.

Lunar Eclipses.—An eclipse of the moon is an obscuration of the light of the moon occasioned by an interposition of the earth between the sun and the moon; consequently, all eclipses of the moon happen at full moon; for it is only when the moon is on that side of the earth which is turned away from the sun, and directly opposite, that it can come within the earth's shadow. Further, the moon must at that time be at the same time in the same plane as the earth's shadow; that is, the plane of the ecliptic in which the latter always moves. But as the moon's orbit makes an angle of more than 5° with the plane of the ecliptic, it frequently happens that, though the moon is in opposition, it does not come within the shadow of the earth.

Planetary Eclipses.—The eclipse of a satellite takes place when the shadow of the primary obscures it. Jupiter offers the most favorable field for observation of this phenomenon. Such eclipses were formerly used to determine longitudes since they are the same viewed from all parts of the earth. The dates of a number of important events of antiquity have been approximately determined by calculations concerning eclipses recorded at or near the time. Eclipses have been calculated up to the year 2161.

ÉCOLE DES BEAUX ARTS (ā-kol' dā bō zär) (School of Fine Arts), the French Government school in Paris, founded by Mazarin in 1648, and provided with an extensive staff of teachers. The competitions for the *grands prix de Rome* take place at this school. All artists between the age of 15 and 25, whether pupils of this school or not, may compete, after passing two preliminary examinations. The successful competitors receive an annual allowance from the state for three or four years, two of which must be passed at Rome. The school has about 2,000 students enrolled, and about 50 instructors.



ECLIPSE

A. Eclipse of the moon B. Eclipse of the sun

ÉCOLE POLYTECHNIQUE (pol-i-tek-nēk') (Polytechnic School), a school in Paris established with the purpose of giving instruction in matters connected with the various branches of the public service, such as mines, roads and bridges, engineering, the army and the navy, government manufactures, etc. It was founded in 1794, and is under the direction of the Minister of War. Candidates are admitted only by competitive examination, and have to pay for their board (about $200 a year). The pupils who pass satisfactory examinations at the end of their course are admitted to that branch of public service which they select.

ECONOMIC ASSOCIATION, AMERICAN, a society founded in 1885 by persons interested in questions of political economy or the economic side of social and political conditions. Its 2,500 members consist largely of teachers of economics in the colleges and schools and a number of business and professional men interested in current problems. The annual meeting of the society takes place during the Christmas vacation of the colleges and is held alternately in an eastern and a western city. The association publishes a very valuable periodical, a quarterly, the "American Economic Review." In addition to this the society issues the reports of its annual meetings, which contain valuable monographs and theses on economic subjects.

ECUADOR (ek′ wa-dor), a republic of South America, situated under the equator, whence it takes its name, between Peru and Colombia. It is of triangular shape, its base resting mainly on the Pacific, between lat. 1° 20′ N. and 4° 50′ S., its apex extending to about lon. 71° 30′ W.; area, about 116,000 square miles, excluding the Galapagos Islands. Between Ecuador, Peru, and Colombia there have been boundary disputes. That with Colombia was settled in 1917.

Topography.—The country is divided into 16 provinces and 1 territory, and falls, as regards the surface, into three sections; the comparatively narrow and low-lying coast regions, the mountain region, and the extensive plains on the E. The mountain region is formed by a double range of snow-clad mountains, several of them active volcanoes, which inclose a longitudinal valley or tableland, with a breadth of 20 to 40 miles, and varying in elevation from 8,500 to 13,900 feet. The most elevated of these mountains are in the W. range, Chimborazo, Pichincha, and Cotacachi, Chimborazo being 20,703 feet high. In the E. range are Cayambe, Antisana, and Cotopaxi (19,500). The cultivated land and the population of Ecuador lie chiefly in this elevated region, which extends along between the summits of the Cordillera, and may be considered as divided by transverse ridges or dikes into the valleys of Quito, Hambato and Cuenca. The chief towns here are Quito, the capital (pop. 70,000); Riobamba and Cuenca, all situated at a height of 9,000 feet or more above the sea. The chief port of Ecuador is Guayaquil (pop. 65,000). The most considerable rivers, the Tigre, Napo, Pastaza, etc., belong to the basin of the Amazon; and some of them, notably the Napo, are navigable for long distances. On the W. slope of the Andes the chief rivers are the Esmeraldas and the Guayaquil.

Climate and Productions.—The climate on the plains, both in the E. and the W., is moist, hot, and unhealthful. In the higher regions it is rough and cold, but in great part the elevated valleys, as that of Quito, have a delightful climate. Here the chief productions are potatoes, barley, wheat, and European fruits. In the lower regions are grown all the food products of tropical climates, cacao, coffee, sugar, etc. Ecuador is comparatively poor in mammalia, though various kinds of deer as well as tapirs and pecaries are found in the forests. Parrots and humming-birds are also numerous, but perhaps the most remarkable of the birds is the condor, which dwells on the slopes of the Andes. Reptiles, including serpents, are numerous. The forests yield cinchona bark, caoutchouc, sarsaparilla, vegetable ivory, etc.

Commerce.—The international trade passes almost exclusively through the port of Guayaquil. In 1918 the imports for the previous five years were valued at $8,345,360. Imports from the United States (1918) $4,766,215. Exports $13,745,265. Exported to United States $4,793,345. The principal articles imported are cotton and woolen textiles, furniture, hardware, cutlery, provisions, malt liquors and spirits, silks, jewelry, laces, stationery, wines, breadstuffs, leather goods, and fancy articles; the principal exports are cacao (three-fourths of entire export), coffee, hides, vegetable ivory and caoutchouc.

Industries.—The principal product of Ecuador is cacao, and the cultivation of this article shows some increase in recent years. The cacao plantations are, for the most part, situated on the low-lying lands in the vicinity of the Guayaquil river. In 1919 the cacao crop was 22,474 cwt.; coffee (1917) 5,562,942 lbs.; rubber (1917) 239,018, ivory nuts 3,000 lbs. Sugar is manufactured principally for home consumption and the same may be said of tobacco and cotton, though some are exported. Pastoral industry is practically confined to raising cattle to fill the home demand for beef. Hides are exported principally to the United States.

Mining.—Very little has been attempted in modern times in the direction of mining industry in Ecuador. In the province of Esmeraldas hydraulic washing of gravel beds is being carried on by an American company, and quartz crushing is also in progress at Zuruma, in the province of Oro. The Indians do some washing in the beds of streams and rivers; a small supply of gold is obtained from this source. The existence of petroleum has been proved in various localities, but nothing has yet

been done to develop an industry in this product. Deposits of copper, lead, iron, and coal also occur, but are not worked. In the province of Cuenca valuable lodes of silver-bearing ore are known, but are not exploited. Quicksilver is said to exist in the province of Loja. Careful prospecting of the mineral resources of Ecuador would doubtless disclose much natural wealth, but the difficulties and cost of transport have hitherto proved insurmountable obstacles to the practical development of the mining industry.

Manufactures.—Manufacturing industry is confined within very small limits. It is represented by the chocolate manufacturing concerns, some woolen and cotton textile mills on a comparatively limited scale, four sawmills, a biscuit factory, a brewery and ice factory in the city of Guayaquil, and a few soap factories. It is now proposed to extend the manufacture of woolen and cotton goods, and for this purpose to utilize water to obtain the required power. The manufacture of fine straw hats is a native industry in Ecuador, these hats being shipped abroad under the name of Panama and selling for high prices.

Communications.—The roads in Ecuador are principally bridle-paths generally impassible in wet and winter weather. In 1908 a company formed in the United States completed the railroad (297 miles) from Guayaquil to Quito. There is also a Central R. R. from Manta to Santa Anna, 35 miles, and a road connecting Bahia, Caracas and Quito, 168 miles. Other railroads are projected. The telegraph system covers 5,482 miles. There are six wireless stations.

Education.—The educational system of the country has been greatly improved in recent years. In 1916 new courses of study were introduced in the primary schools and these were extended in 1918 to the high-school courses. Primary instruction is free and obligatory for all children, beginning with six years. In 1919 there were 103 mixed schools, 241 primary schools, 122 grammar schools, 16 high schools, 385 fiscal schools, 57 municipal schools, and 40 private schools. In all these there was an enrolment of about 48,000. High-school instruction is given in the national colleges. Each of the provinces, with the exception of Esmeraldas, has one of these colleges.

Religion.—The Roman Catholic, under the constitution, is the only form of religion tolerated.

Government.—The executive government (since Dec. 1906) is vested in a President, elected for four years, who is assisted by a Council of State of five members. The Congress is the legislative body, and consists of two Houses, one formed of senators, two for each province, the other of deputies, one for every 30,000 inhabitants, both elected by universal suffrage. The Congress has extensive privileges and cannot be dissolved by the President. The seat of government is at Quito. In 1920 the estimated revenue was $9,997,830. The money unit is the sucre, equivalent to a 5-franc piece, but the coins of the United States, France, and Great Britain circulate.

History.—Ecuador at the time of the conquest of Peru by the Spaniards formed part of the great empire of the Incas. It was erected first into a viceroyalty of Peru, then (from 1564 to 1718) into an independent presidency. In 1718 it became part of the presidency of New Granada. During the revolutionary war against Spain, Ecuador, along with the neighboring territories, secured its independence in 1822, and was ultimately erected into a separate republic in 1831. Of the present population, the aboriginal red face forms more than half; the rest are negro and Indian blood, and Spanish Creoles or whites. The latter are the chief possessors of the land. Pop. 2,000,000. In April, 1920, an Italian military and commercial commission visited the country. A tobacco monopoly was arranged for an Italian company in Ecuador, in consideration of which Italy undertook the construction of public works in the country. On Aug. 31, 1920, Dr. José Luis Tamayo was inaugurated president.

ECZEMA (ek-zē'mä), one of the commonest of all dieases of the skin, and also the most variable in its manifestations. It may be acute or extremely chronic, may affect any portion of the skin, and may occur at any age from infancy to old age.

In typical acute eczema the affected portion of skin is red, and is covered with numerous small papules, which speedily turn into vesicles. These may quickly dry up, but more commonly break, and discharge a clear, glutinous secretion, which hardens and forms scabs or crusts, or if copious keeps the surface in a moist "weeping" condition. In some cases the vesicles are replaced by pustules, and the discharge is partly purulent. Chronic eczema may follow the acute form, or may arise without an acute stage. Here the skin is thickened and hard, and covered with crusts or scales; deep cracks are sometimes present, especially where the skin is subjected to much movement, as near the joints.

One of the most prominent and important symptoms is itching of the part affected; it is never entirely absent, and

in some cases intolerably severe, but in the acute stage is often replaced by a burning sensation; it may precede any visible sign of the disease, and may persist after the skin has resumed its natural appearance. The scratching which it occasions always aggravates the disease, and is often very difficult to prevent. Except in extensive acute attacks, there is no fever and very little constitutional disturbance. The disease is not contagious. When cured it leaves no scar.

Causes of Eczema. — In many cases it is very difficult, perhaps impossible, to assign a definite cause for an attack. Generally speaking, however, the constitutional or predisposing cause is some defect in the digestion or assimilation of the food; strumous and gouty individuals are particularly subject to the disease. The local or exciting cause may be anything whatever which irritates the skin.

Treatment.—There is no specific for eczema; different cases and different stages of the disease require widely different management, and each must be considered and treated on its own merits. The diet must be nutritious, but as simple and unirritating as possible; digestion may require aid from medicines; the bowels should be regularly evacuated, by aperients if necessary; a gouty or strumous tendency if present must be counteracted. The use of soap on the part affected must be discontinued, and strained oatmeal gruel, or rice water, or white of egg with boiled water, used for cleansing purposes, but even these as seldom as possible. Thorough removal of scales and crusts by these means, or by oil, or simple bread poultices, is the necessary preliminary to satisfactory local treatment. In the acute stage, where the swelling is great or the discharge profuse, a sedative lotion applied on rags or lint and kept moist by a waterproof covering, is generally most useful—*e.g.*, thin starch or gruel, with a teaspoonful of boracic acid to the pint, soft water with a similar proportion of baking-soda, or dilute lead lotion. In the later stages, when the skin is moist, soothing ointments are preferable—*e.g.*, zinc ointments, zinc and boracic ointments mixed in equal parts, or cold cream. The ointment should be evenly spread on linen rag, and kept in close contact with the affected skin.

EDDY, MARY BAKER GLOVER, an American reformer; born in Bow, N. H.; received a public school education, and was connected with the Congregational Church till 1866, when she discovered what are known as the principles of Christian Science. In 1867 she began to teach them, and in 1879 founded the Church of Christ (Christian Scientist) in Boston, Mass. In 1881 she was ordained to the ministry; in the same year established the Massachusetts Metaphysical College in Boston; and in 1883 started the "Christian Science Journal." She is the author of "Science and Health, With Key to the Scriptures" (the Christian Science text-book); and numerous other works. She died Dec. 3, 1910. See CHRISTIAN SCIENCE.

EDDY, SPENCER, an American diplomat, born in Chicago, Ill., in 1874. He graduated from Harvard University in 1896. He took post-graduate studies in Germany. In 1897-1898 he acted as private secretary of the late John Hay, while the latter was ambassador to Great Britain. In 1899 he was appointed 3d secretary of the American Embassy at London. He served successively in the embassies of Paris, Constantinople, St. Petersburg, and Berlin. In 1908-1909 he was Minister to Argentina, and in 1909 was Minister to Rumania, Serbia, and Bulgaria. He resigned to enter the Naval Reserve as lieutenant-commander, and during the World War was engaged in active service.

EDDYSTONE, a group of gneiss rocks, daily submerged by the tide, in the English Channel, 9 miles off the Cornish coast, and 14 S. S. W. of Plymouth Breakwater. The rocks lie in lat. 50° 10′ 54″ N., and long. 4° 15′ 53″ W., and have 12 to 150 fathoms water around. The frequent shipwrecks on these rocks led to the erection of a lighthouse on them by Winstanley in 1696-1700. It was a wooden polygon, 100 feet high, with a stone base; but the great storm of Nov. 20, 1703, completely washed away this primitive structure. Another lighthouse, built in 1706-1709, also of wood, with a stone base, and 92 feet high was burned in 1755. The next was constructed by Smeaton in 1757-1759. It was built of blocks, generally one to two tons weight, of Portland oölite, incased in granite. The granite was dovetailed into the solid rock, and each block into its neighbors. The tower, 85 feet high, had a diameter of 26¾ feet at the base, and 15 feet at the top. The light, 72 feet above the water, was visible at a distance of 13 miles. As the rock on which this tower was built became undermined and greatly weakened by the action of the waves, the foundation of another was laid on a different part of the reef in 1879. The new lighthouse, completed in 1882 by Sir James N. Douglass, is, like its predecessor, ingeniously dovetailed throughout. Its dioptric apparatus gives, at an elevation of 133 feet,

a light equal to 159,600 candles, and visible in clear weather to a distance of 17½ miles.

EDEN, the garden of paradise. "It would be difficult," says a writer in Smith's "Dictionary of the Bible" (i. 482), "in the whole history of opinion, to find any subject which has so invited, and at the same time so completely baffled conjecture, as the Garden of Eden. The three continents of the Old World have been subjected to the most rigorous search; from China to the Canary Isles, from the Mountains of the Moon to the coasts of the Baltic, no locality which in the slightest degree corresponded to the description of the first abode of the human race has been left unexamined." Philo Judæus (flourished about 20) first broached the allegorical theory of interpretation, teaching that paradise shadowed forth the governing faculty of the soul, and that the tree of life represented religion, the true means of immortality. Origen, adopting a somewhat similar view, regarded Eden as heaven, the trees as angels, and the rivers as wisdom; and Ambrosius considered the terrestrial paradise and the third heaven, mentioned by St. Paul (II Cor. xii: 2-4), as identical. Luther taught that Eden was guarded by angels from discovery and consequent profanation until the Deluge, when all traces were destroyed. Swedenborg, who regarded the first 11 chapters of Genesis as constituting a divine allegory, taught that Eden represented the state of innocence in which man was orginally created and from which he degenerated in consequence of the Fall.

EDGAR ATHELING, grandson of Edmund Ironside and son of Edward the Outlaw, was born in Hungary, where his father had been conveyed in infancy to escape the designs of Canute. After the battle of Hastings, Edgar (who had been brought to England in 1057) was proclaimed King of England by the Saxons, but made peace with William and accepted the Earldom of Oxford. Having been engaged in some conspiracy against the king he was forced to seek refuge in Scotland, where his sister Margaret became the wife of Malcolm Canmore. Edgar subsequently was reconciled with William and was allowed to live in Rouen, where a pension was assigned to him. Afterward with the sanction of William Rufus he undertook an expedition to Scotland for the purpose of displacing the usurper Donald Bane, in favor of his nephew Edgar, son of Malcolm Canmore, and in this object he succeeded. He afterward took part in Duke Robert's unsuccessful struggle with Henry I., but was allowed to spend the remainder of his life quietly in England.

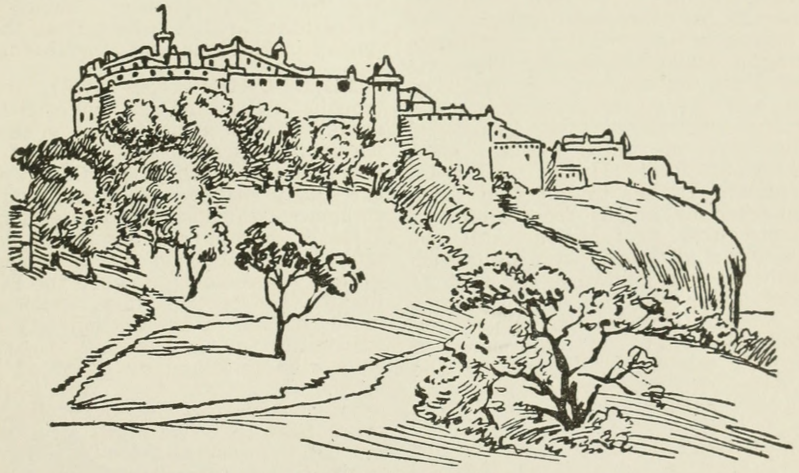
EDGEWORTH, MARIA, an English novelist born in Black Bourton, Oxfordshire, Jan. 1, 1767. Her principal works are: "Castle Rackrent" (1800); "Early Lessons" (1801); "Belinda" (1801); "Moral Tales" (1801); "The Modern Griselda" (1804); "Leonora" (1806); "Tales of Fashionable Life" (1809-1812); "Patronage" (1814); "Ormond" (1817); and "Helen" (1834). She died in Edgeworthstown, Ireland, May 22, 1849.

EDICT OF NANTES, an edict by which, on April 13, 1598, Henry IV. of France granted toleration to his Protestant subjects. It was revoked on Oct. 22, 1685, by Louis XIV., the unwise act causing the expatriation of about 50,000 Protestant families, who carried their industry to England and other lands.

EDINBURGH (ed'n-bur-ō), the metropolis of Scotland and one of the finest as well as most ancient cities in the British empire; lies within 2 miles of the S. shore of the Firth of Forth. It is picturesquely situated, being built on three eminences which run in a direction from E. to W., and surrounded on all sides by lofty hills except on the N., where the ground slopes gently toward the Firth of Forth. The central ridge, which constituted the site of the ancient city is terminated by the castle on the W., situated on a high rock and by Holyrood House on the E., not far from which rise the lofty elevations of Salisbury Crags, Arthur's Seat (822 feet high), and the Calton Hill overlooking the city. The valley to the N., once the North Loch, but now drained and traversed by the North British railway, leads to the New Town on the rising ground beyond. The houses here are all built of a beautiful white freestone found in the neighborhood.

From Prince's street, which is lined by fine gardens adorned with Sir Walter Scott's monument and other notable buildings, a magnificent view of the Old Town with its picturesque outline may be obtained. The principal street of the Old Town is that which occupies the crest of the ridge on which the latter is built, and which bears at different points the names of Canongate, High street, Lawnmarket, and Castle Hill. This ancient and very remarkable street is upward of a mile in length, rising gradually with a regular incline from a small plain at the E. end of the town, on which stands the palace of Holyrood, and ter-

minating in the huge rock on which the castle is built, 383 feet above sea-level. The houses are lofty and of antique appearance. Among the notable buildings are the ancient Parliament House, now the seat of the supreme courts of Scotland; St. Giles' church or cathedral, an imposing edifice in the later Gothic style, recently carefully restored; the Tron Church; Victoria Hall (where the General Assembly of the Established Church meets), with a fine spire; the Bank of Scotland, etc. From this main street descend laterally in regular rows numerous narrow lanes called closes; those which are broader, and admit of the passage of carriages, are called wynds. In these and the adjacent streets the houses are frequently more than 120 feet in height, and divided into from 6 to 10 stories, or flats. In the Old Town the most remarkable public building is the castle. This fortress contains accommodations for 2,000 soldiers, and the armory space for 30,000 stand of arms.



EDINBURGH CASTLE

The palace of Holyrood, or Holyrood House, stands, at the lower or E. extremity of the street leading to the castle. No part of the present palace is older than the time of James V. (1528), while the greater portion of it dates only from the time of Charles II. In the N. W. angle of the building are the apartments which were occupied by Queen Mary. Adjoining the palace are the ruins of the chapel belonging to the Abbey of Holyrood, founded in 1128 by David I. The Advocates' Library, the largest library in Scotland, contains upward of 250,000 printed volumes and 2,000 MSS.

On the S. side of the Old Town, and separated from it also by a hollow crossed by two bridges (the South Bridge and George IV. Bridge), stands the remaining portion of the city, which is mostly modern. Besides the buildings already noticed Edinburgh possesses a large number of important edifices and institutions, chief among which are the Royal Institution, the National Gallery of Scotland, the Museum of Science and Art, the new Episcopal Cathedral of St. Mary's, etc. Among the more prominent educational institutions are the university, the high school, the academy, the New or Free Church Theological College, the United Presbyterian Theological Hall, the Edinburgh School of Medicine, the Veterinary College, the Fettes College, the Heriot-Watt College of Science and Literature. The manufactures of Edinburgh are neither extensive nor important. Printing, book-binding, coach-building, type-founding, machine-making, furniture-making, ale-brewing, and distilling are the principal industries. Edinburgh is the headquarters of the book trade in Scotland, and the seat of the chief government departments.

The origin of Edinburgh is uncertain. Its name is thought to be derived from Eadwinsburh, the Burgh of Edwin, a powerful Northumbrian king, who absorbed the Lothians in his rule. The town was made a royal burgh in the time of David I.; but it was not until the 15th century that it became the recognized capital of Scotland. Pop. (1918) 333,833.

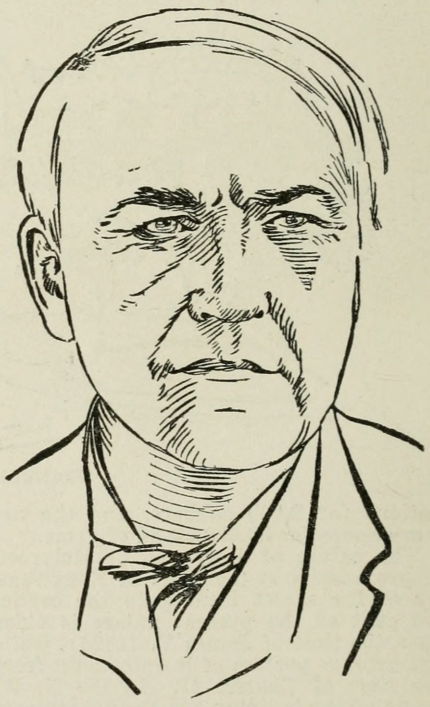
EDINBURGHSHIRE, EDINBURGH, or MIDLOTHIAN, a county of Scotland in the southeastern part, with an area of 366 square miles. The county has over 10 per cent. of the total population of Scotland. In the north are fer-

tile plains. Along the coast are coal mining and other industries, but the greater part of the area of the county is devoted to agriculture. The leading industry is the making of paper. The principal burghs are Edinburgh, the county town and capital of Scotland; Leith, and Musselburgh.

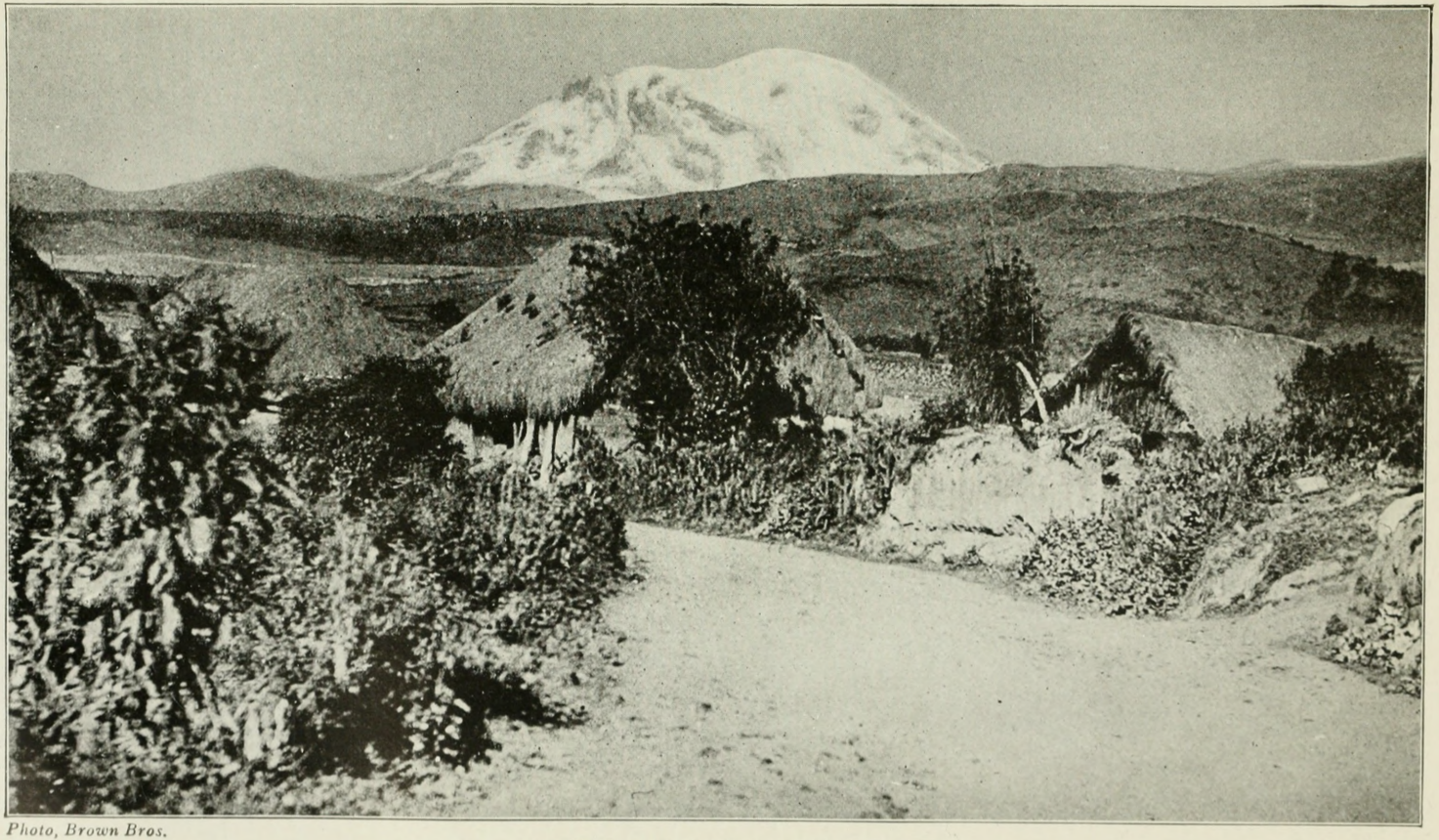
EDINBURGH UNIVERSITY, the latest of the Scottish universities; was founded in 1582 by a charter granted by James VI. The government, as in the other Scottish universities, is vested in the Senatus Academicus, the university court, and the general council. The chancellor of the university is elected for life by the general council. He is the head of the university and the president of the general council. The rector is elected for a term of three years by the matriculated students. He presides over the university court. The principal is the resident head of the college and president of the Senatus Academicus. The university court consists of the rector, principal, the lord-provost of Edinburgh, and assessors appointed by the chancellor, town council of Edinburgh, the rector, the general council, and the senatus respectively. The general council consists of the chancellor, the members of the university court, the professors, and all graduates of the university. There are four faculties, viz., arts, divinity, law, and medicine. Some of the professors are appointed by the crown, others are elected by the university court and by special electors, and a considerable number by the curators, who also elect the principal.

In 1919 the teaching staff numbered 242, and the students 4,300. The degree of M. A. is conferred on all who have completed their course and passed the ordinary examinations in the classical department (Latin and Greek), the department of mathematics and natural philosophy, and that of logic and metaphysics, moral philosophy, and rhetoric and English literature. Three medical degrees are conferred: Bachelor of Medicine (M. B.), Master in Surgery (C. M.), and Doctor of Medicine (M. D.). The degrees in law are Bachelor of Laws (LL. B.), Bachelor of the Law (B. L.), and Doctor of Laws (LL. D.). The last is purely honorary. The degrees of Bachelor of Divinity (B. D.) and Doctor of Divinity (D. D.), the latter honorary, are bestowed in the faculty of divinity. Degrees in science are also conferred. That of B. Sc. is conferred only in mathematical, physical, and natural science, in engineering, and in public health. In 1918 the university instituted a degree in commerce (B. Comm.). The present university buildings were begun in 1789. The library of the university contains about 270,000 printed volumes, besides 8,000 manuscripts. There is also a separate theological library containing about 10,000 volumes. Among the new buildings erected in this century are the Hughes Bennett Physiological Laboratory, John Usher Institute of Public Health (1902) and a new block of buildings devoted to engineering (1905). The university's annual revenues are about $500,000.

EDISON, THOMAS ALVA, an American inventor; born in Milan, O., Feb. 11, 1847. In early life he was denied the privileges of continuous schooling, but acquired a large and varied stock of knowledge by his own industry. Before he was 12 years of age he became a train boy on the Detroit and Port Huron branch of the Grand Trunk railroad, and learned to operate the telegraph. He began to study batteries, wires, and instruments, wherever he could find them. His first invention to be patented was a commercial stock indicator, and the proceeds of this invention, which at once came into wide use, enabled him to establish a laboratory at Newark, N. J., afterward removed to Menlo Park, and then to its present location at West Orange, N. J. From this beginning he became known to

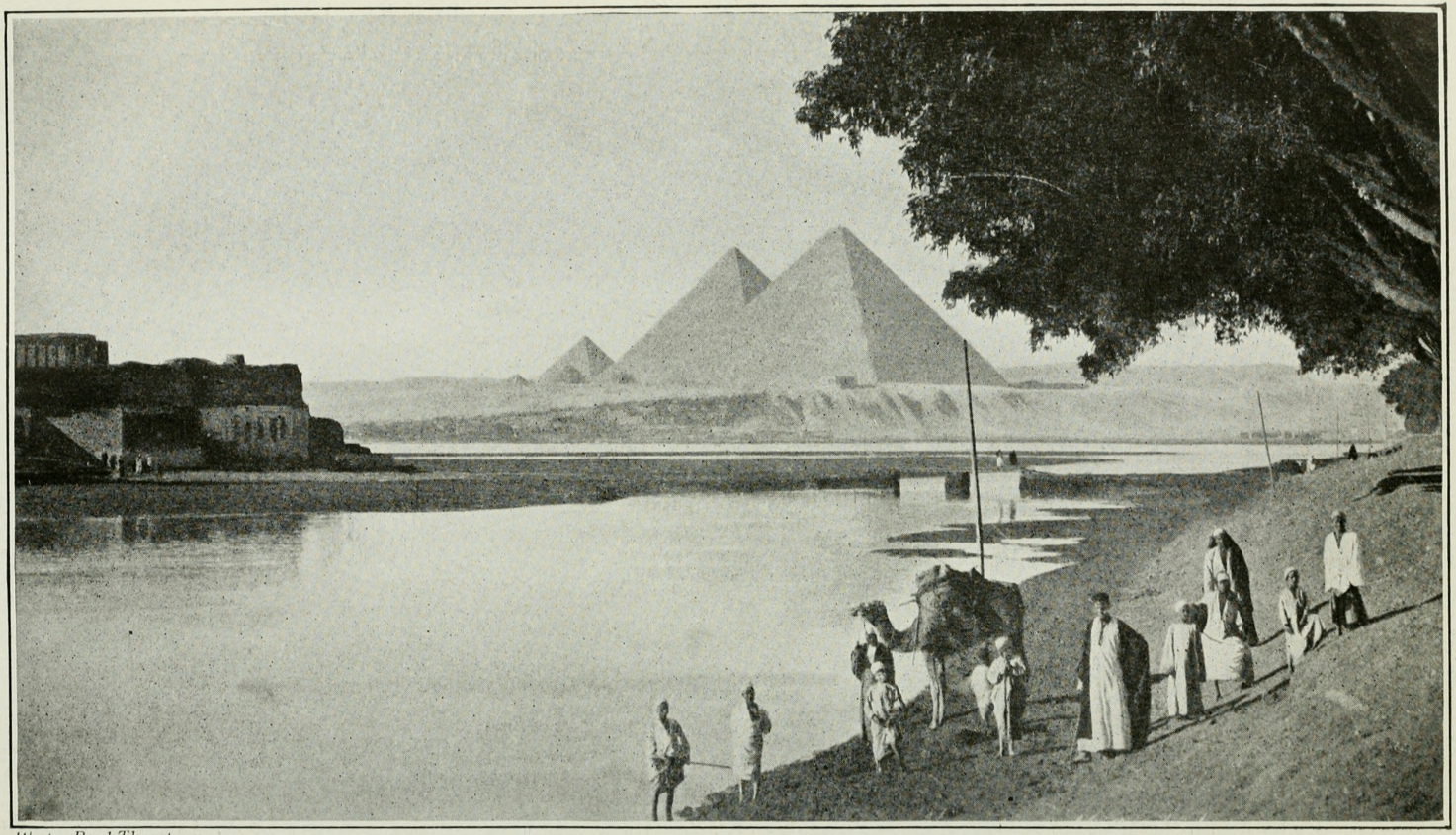


THOMAS A. EDISON



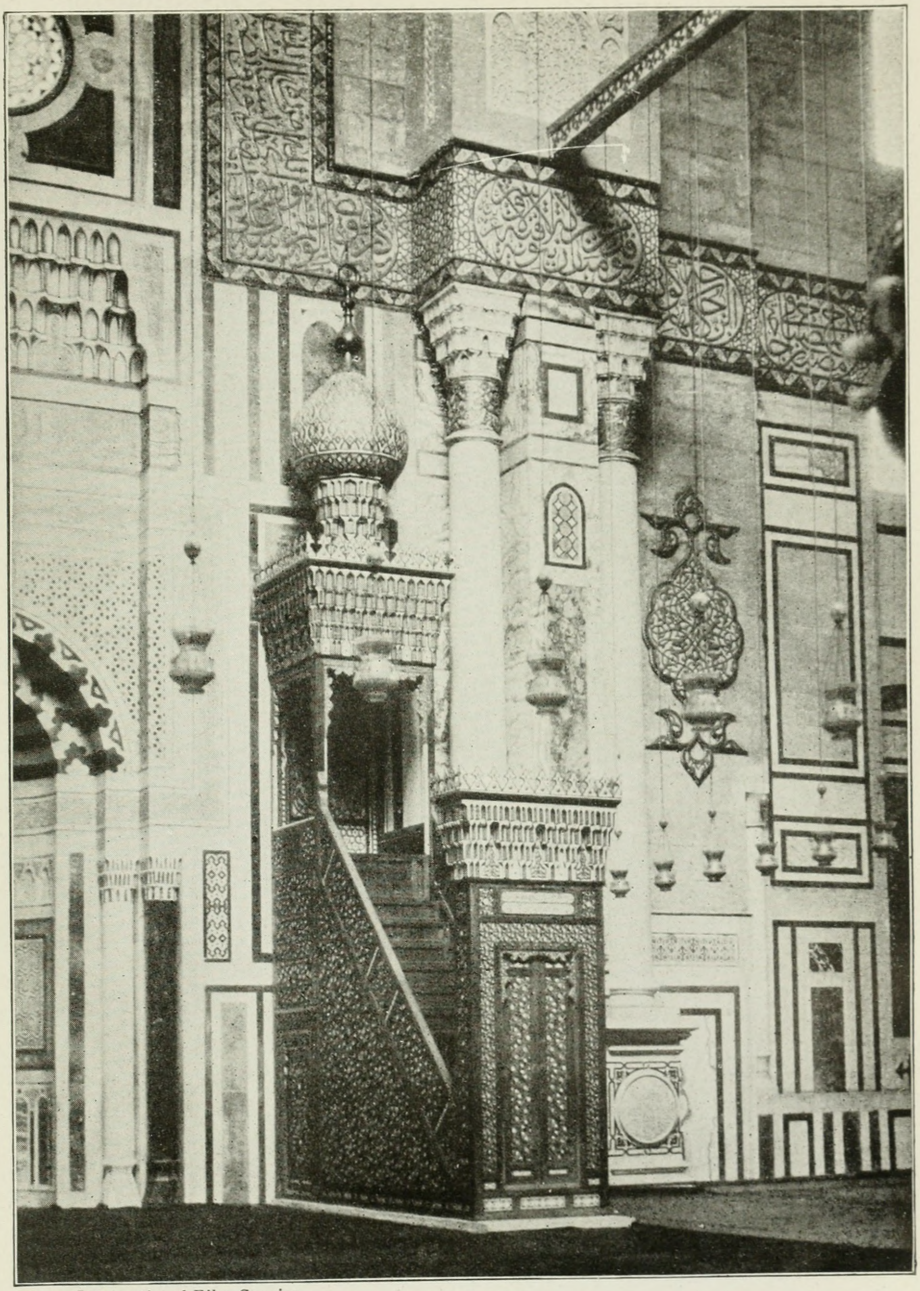
Photo, Brown Bros.

A VIEW OF MT. CHIMBORAZO, ECUADOR



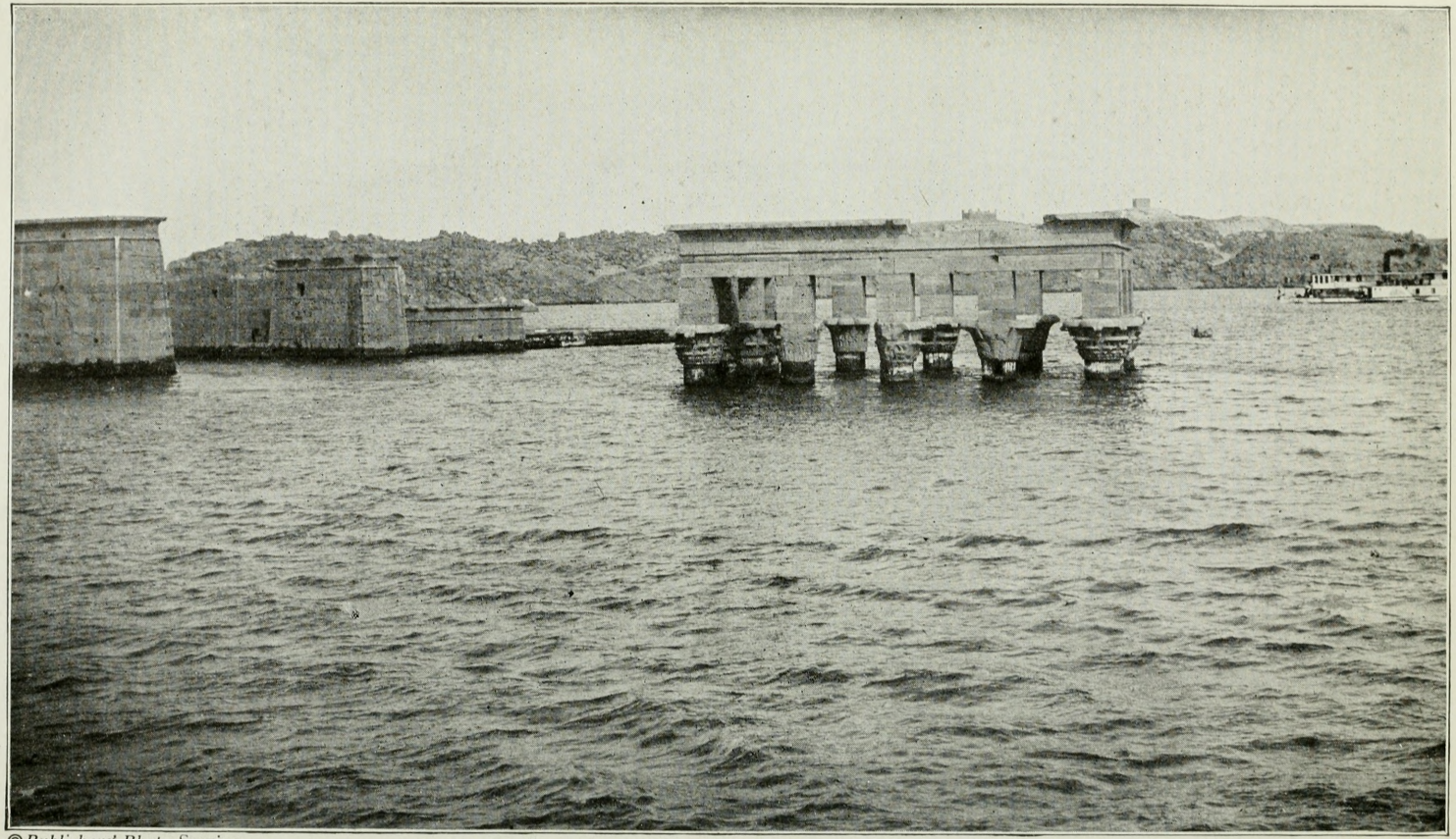
Photo, Paul Thompson

PYRAMIDS, ROCK TOMBS AND GRANITE TEMPLE AT GIZEH, EGYPT



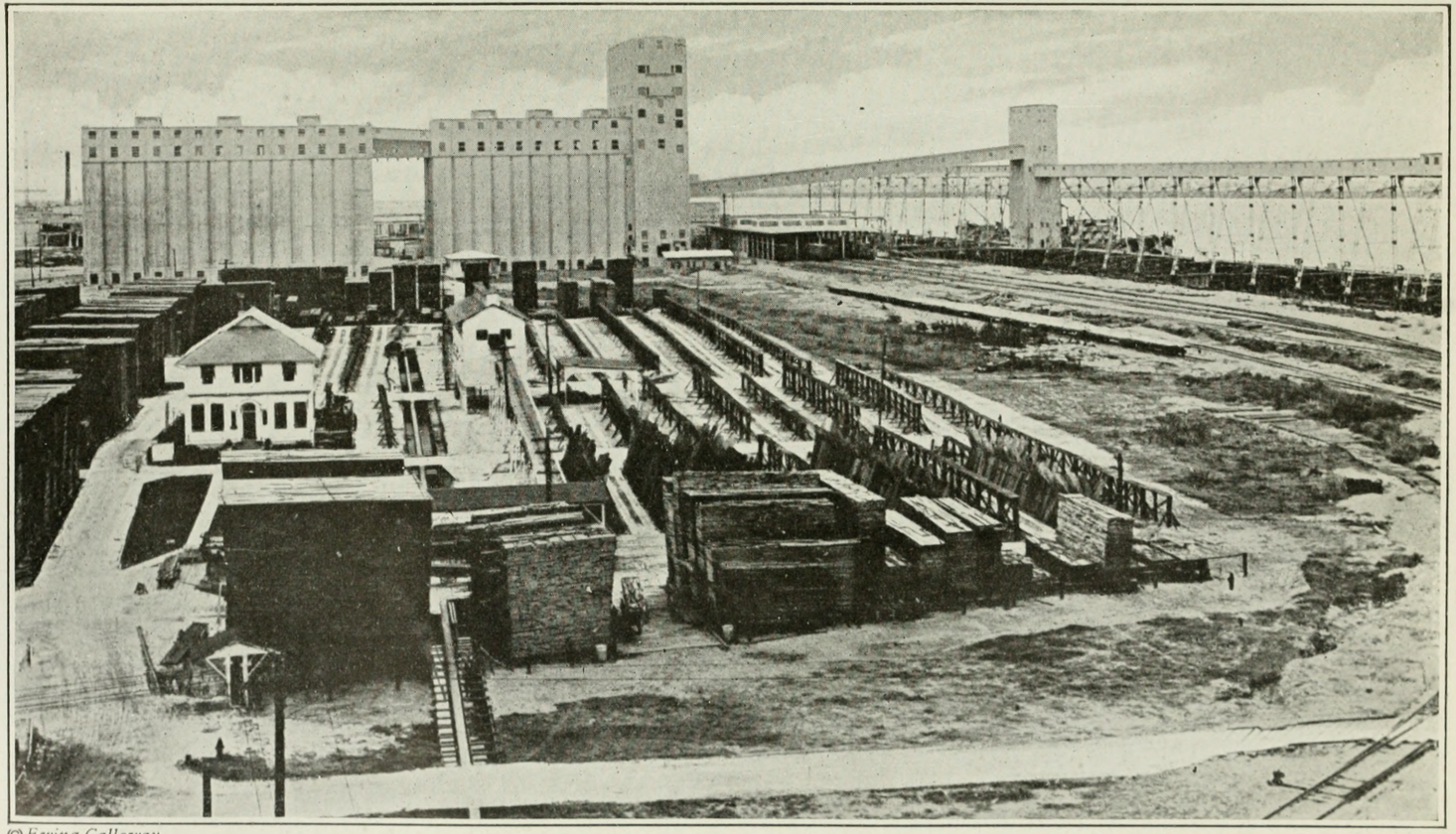
Photo, International Film Service

PULPIT OF IVORY, EBONY, AND ALABASTER IN THE MOSQUE OF SULTAN HASSAN, CAIRO



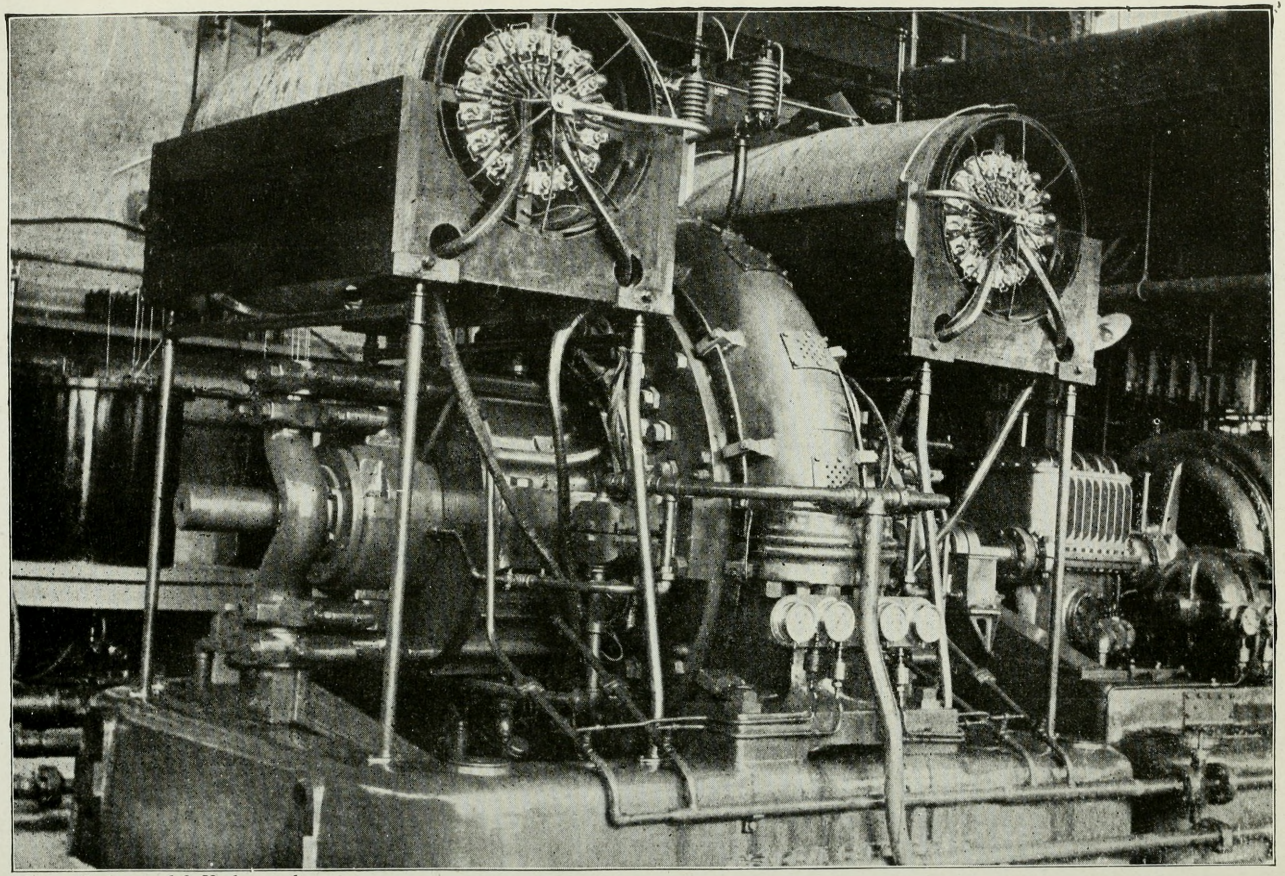
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THE TEMPLE OF PHILAE, PARTLY SUBMERGED BY THE WATERS OF THE NILE BECAUSE OF THE CONSTRUCTION OF THE ASSOUAN DAM



© Ewing Galloway

THE PUBLIC GRAIN ELEVATOR AT NEW ORLEANS, LA., ONE OF THE BEST EQUIPPED IN THE WORLD



Photo, Underwood & Underwood

A HIGH-FREQUENCY ALTERNATOR USED IN SENDING WIRELESS MESSAGES. ALTERNATOR IN CENTER; DYNAMO AT RIGHT; TRANSFORMER, ABOVE



©*International Film Service*

LOWER BROADWAY, NEW YORK, SHOWING ITS ELECTRIC LIGHTING AT NIGHT



Photo, Ewing Galloway

A GEARLESS ELECTRIC LOCOMOTIVE DRAWING A TRAIN IN THE MOUNTAIN SERVICE, NORTHWESTERN UNITED STATES

all the world as one of the greatest inventors of the 19th century. Among his more important inventions may be named the phonograph, a telephone for long distance transmission, a system of duplex telegraphy (which he subsequently developed into quadruplex and sextuplex transmission), the carbon telephone transmitter, the microtasimeter, the aerophone, megaphone, the incandescent electric lamp, the kinetoscope, and a storage battery for street railway cars and automobiles. In 1913 by synchronizing the phonograph and kinetoscope he produced talking moving pictures; but the invention is still imperfect. In 1878 he was made Chevalier of the Legion of Honor by the French Government, a commander of the Legion in 1889, and was the recipient of the insignia of a grand officer of the Crown of Italy bestowed the same year by King Humbert.

EDMUND, ST., King of the East Angles, began to reign in 855; was revered by his subjects for his justice and piety. In 870 his kingdom was invaded, and he himself slain, by the Danes. The Church made him a martyr, and a town (Bury St. Edmunds) grew up round the place of his sepulture.

EDMUND I., King of England, an able and spirited prince; succeeded his brother Athelstan in 940. He conquered Cumbria, which he bestowed on Malcolm, King of Scotland, on condition of doing homage for it to himself. He was slain at a banquet May 26, 946.

EDMUND II., surnamed Ironside, King of England, was the eldest son of Ethelred II., and was born in 989. He was chosen king in 1016, Canute having been already elected king by another party. He won several victories over Canute, but was defeated at Assandum in Essex, and forced to surrender the midland and N. counties to Canute. He died after a reign of only seven months.

EDMUNDS, GEORGE FRANKLIN, an American lawyer; born in Richmond, Vt., Feb. 1, 1828; received a common school education; began practicing law in 1849; and two years later removed to Burlington, Vt. In 1866 he was elected to the United States Senate to fill an unexpired term, and was thrice re-elected for full terms. He was the author of the act of March 22, 1882, known as the "Edmunds Act," which provided for the suppression of polygamy in Utah and the disfranchisement of any person convicted of practicing it. He was also the author of the "Anti-trust Law" of 1890. During the term of President Arthur he was president pro tempore of the Senate. In 1897 he became chairman of the Monetary Commission which had been appointed by the executive committee of the Indianapolis Monetary Conference. After this service Mr. Edmunds returned to the profession of the law. He died in 1919.

EDRED, King of England, son of Edward the Elder, succeeded to the throne on the murder of his brother, Edmund I., in May, 946. He quelled a rebellion of the Northumbrian Danes, and died in 955.

EDSON, CYRUS, an American bacteriologist; born in Albany, N. Y., Sept. 8, 1857; was graduated at the New York College of Physicians and Surgeons in 1881 and in the following year was appointed a sanitary inspector. In 1893-1895 he was health commissioner of New York. Dr. Edson discovered a new treatment for consumption, malaria, and other germ diseases, in 1896, which he named aseptolin. He published about 80 medical and sanitary papers, and invented many surgical instruments. He died in New York, N. Y., in 1903.

EDUCATION, the art of drawing out or developing the faculties, the training of human beings for the functions for which they are destined. Education means the imparting or gaining of knowledge of every kind, good as well as evil; but specifically it signifies all that broadens a man's mind, disciplines his temper, develops his tastes, corrects his manners, and molds his habits. In a still more limited sense it means any course of training pursued by parents, teachers, or a whole community to train the young physically, mentally, and morally. The means employed in education fall naturally under two heads: discipline or moral training, and instruction, or the imparting of information; though the two often run into each other. Under the head of discipline come the forming of habits of order, self-control, obedience, civility, love of truth and reverence for what is good and great. In respect of direct utility the things most necessary to know are those that bear most directly (1) on the preservation of life and health, and the proper performance of the more common industrial labors. This involves a knowledge of the sciences of physiology, natural philosophy, and the other physical sciences. (2) A knowledge of our moral relations. Besides a knowledge of the ordinary moral duties, and the high religious sanctions with which they are enfored, this implies some acquaintance with the laws of economy. (3) As a preliminary step, there is required a knowledge of the mother-tongue, and the faculty of reading and writing it. (4) The cultivation of the taste and

imagination, or the faculties which derive pleasure from music, painting, sculpture, architecture, poetry, and works of fiction.

United States. — Education in the United States naturally divides itself historically into two parts: Colonial and National. Education in the 13 colonies deserves attention for its originality and its marked influence in preparing the colonies for national independence. Immediately on landing, in 1620, one of the first acts of the Plymouth colonists was to provide a meeting-house for religious services and a schoolhouse for the children. The citizens of Boston as early as 1635, by vote, appointed a schoolmaster. By law of the Massachusetts colony in 1642, the selectmen of every township were required to see that provision was made for the education of all the children, so as to be able to read and have "knowledge of the capital laws." In 1647 every township of 50 householders was required to appoint a schoolmaster, and every township of 100 families to maintain a grammar shool in which boys could be prepared for Harvard College. The Colonial laws of Connecticut, New Hampshire, and Rhode Island, with reference to public education, were explicit, and were enforced so as to secure practically universal elementary education. New York was not behind New England in similar legal educational provisions, but they do not seem to have been so well enforced. The West India Company, under whose charge the first Dutch colonists came to New York, enacted a law in 1629 which required the establishment of schools. The first school was opened in 1633, speedily followed by others. Church and state united to pay the expenses of the schools, and no charge was made directly for tuition; Dutch schools existed in the towns and villages when the English obtained possession of the colony, After this great difficulties arose from the conflict of the two languages, and though many English schools were established education greatly suffered for a few years. In 1704 a society for the propagation of the Gospel began its work of establishing schools in the English language in several of the counties. In 1732 an act was passed to establish a public school in the city of New York; King's College, afterward Columbia College, was founded in 1754. New Jersey, as early as 1693, by law enabled the inhabitants of any town to establish a free school and to tax all the property holders for its support, under which law schools became numerous. Pennsylvania had many private schools, but no educational system previous to the Revolution. In Virginia little attention was paid to the education of the poorer classes, but the College of William and Mary was established in 1692. Maryland passed an act as early as 1723 for erecting schools in several counties. The Southern colonies generally had not succeeded in establishing public schools previous to the Revolution, though numerous private schools existed.

Subsequent to the Revolution education received a great impulse in the new nation. The New England States, including Vermont and Maine, added, after the Revolution, all adopted systems of public schools. New York at first encouraged private schools, and in 1785 created a Board of Regents of the University of New York, whose chief function for many years was to encourage academies and colleges; but in 1795 common schools of the New England type were greatly encouraged. Pennsylvania and New Jersey both adopted similar systems. The new States of the Northwest were anxious to attract emigrants and to provide for the future good by similar systems, and flourishing common schools became the rule throughout these States.

Most of the States have educational funds for the aid of the public schools which are distributed to the schools on compliance with certain conditions, which usually require the existence of a State supervisor under the direction of State Boards of Education, with some executive officer, or State Superintendent of Education. The various school funds, so called, have had different origins, though most of them have come from the grant of lands by the States for this purpose, or by the Federal grant of one thirty-sixth of all the lands in the States admitted to the Union since 1785. In 1848 the United States granted another thirty-sixth of the land for schools, so that since then all the States admitted have had one-eighteenth of the land thus appropriated. In some instances each county has been permitted to collect and expend the result of the sale of these school sections of land. Usually the State has borne the expense of selling and collecting the money for these lands, and has charged itself with the proceeds, the result of which is called a State educational fund, the annual interest of which is expended by the State for public schools. These funds for public schools in the several States will soon exceed $100,000,000. In addition to the income of these funds, so collected, State school taxes are raised, and in some instances local county, city, village, and township taxes.

The practice is rapidly growing of maintaining a large public union school in every considerable village, in which

several teachers are employed and the pupils are graded in classes through which they advance on examination. In some cases a separate high school is maintained. Graduates from the high school are admitted to the State universities and to some of the private or Church universities on certificate of graduation. In the State universities the education is nearly if not quite free for the students who reside in the State. See COLLEGES; also AGRICULTURAL EDUCATION; COEDUCATION; COLLEGES FOR WOMEN; COMMON SCHOOLS; MEDICAL EDUCATION; SCHOOL; SECONDARY SCHOOLS; NORMAL SCHOOL; TECHNICAL EDUCATION; UNIVERSITIES, AMERICAN; UNIVERSITY EXTENSION; EDUCATION.

England. — Before the Reformation there were, with the exception of the universities, very few institutions for the advancement of learning which could be called public. The monasteries had been for centuries the only seminaries in which the sons of gentlemen were able to obtain instruction. Here and there grammar schools had been founded as choristers' schools, or were otherwise connected with ecclesiastical establishments. The revival of learning, and the increased mental activity at the Reformation produced a widely spread demand for the means of instruction. Uniform purpose is manifest in the testaments, deeds of gift, statutes and ordinances by which the character and subsequent career of English schools were intended by their founders to be fashioned. It is to encourage the pursuit of a liberal education, founded on the ancient languages of Greece and Rome, then the only studies which had been so far formulated and systematized as to possess a disciplined character. The period of the Civil War was unfavorable to educational enterprise. The Act of Uniformity and the secession of the Non-conformist clergy brought home to men's minds the conviction that all attempts to incorporate Puritanism into the organic life of the English Church, which followed soon after, must be abandoned as hopeless; and the Toleration Act compelled English churchmen to recognize for the first time the unwelcome truth that dissent had to be reckoned with as a fact. Whereas in the 16th century men founded grammar schools, in the 18th they founded charity schools instead. These institutions rapidly multiplied during the whole of the 18th century and in the beginning of the 19th. The first sign of interest in public instruction evinced by Parliament was the appointment in 1816 of a select committee of the House of Commons on the education of the lower classes of the metropolis. In 1832 Lord Althorp procured the assent of the House to a vote of £20,000 for the erection of school buildings in England.

The main provision for secondary education had for centuries been supplied by endowed grammar schools. Each of these was, however, controlled exclusively by its own body of trustees; and was regarded as a purely local and separate institution. The elaborate inquiry into endowed charities begun in 1818 and concluded in 1837, resulted in the accumulation of a mass of facts; but it did not attempt to furnish any information respecting the educational character and public usefulness of those schools. In 1862 Lord Clarendon's Commission investigated the state of the nine great public schools, Eton, Harrow, Rugby, Winchester, Westminister, Shrewsbury, Charterhouse St. Paul's and the Merchant Tailors. Sir Lyon Playfair in 1879, and Sir John Lubbock in 1880, drafted and introduced without result, measures which provided for the registration of teachers and for the establishment of an educational council. Meanwhile public elementary education in Great Britain had been made free. The devotion of part of the probate duties to the remission of fees gave Scotland free education in 1890; England secured the same privilege under the provisions of the budget of 1891. In 1885 a separation was made of the administrative functions of the Scotch and the English Education Department; the former has since had its own committee of council and its own secretary. The Local Government Act for Scotland for 1889 allotted the sum of $1,005,000 per annum, derived from the probate duties, to the reduction of school fees in state-aided schools throughout the rest of Scotland. The result in time will be to make elementary education in Scotland free.

Ireland.—Up to 1831, when Lord Derby established the national system, parliamentary grants for education had been made through the agency of private societies. In that year a Board of Commissioners was established, with very large powers of administration, including the power to aid in the erection of schools, to appoint inspectors and other officers, to award gratuities to teachers, to establish a model and training school, and to edit and publish suitable school books. The powers thus intrusted to the Irish commissioners were greatly in excess of those ever exercised by the committee of council in England or in Scotland. From the first it was determined that the rights of the Catholic population should be duly regarded; when, in 1861, the whole system was consolidated

by the grant of a royal charter to the commissioners, it was specially provided that of the 20 members of the board, one-half should be Catholics and one-half Protestants. Religious instruction is provided in all the schools, but a stringent conscience clause protects the interests of parents who do not approve of that given in the school.

Canada.—The relation of the provinces of Canada to the Dominion Parliament is very nearly analogous to that of the States of the American Union to the Federal Government. Each province has its own educational laws and its own department of public instruction. The schools of Nova Scotia, British Columbia, Manitoba, New Brunswick, and Ontario are free; but in Quebec there is a school-tax levied on parents for all children of school age.

France.—In France there is a very completely organized system of instruction, *supérieure, secondaire, et primaire*, under the supervision of the Minister of Public Instruction, the schools being all visited and examined by state officers. The professors in the universities are remunerated by the state. The lycées, or secondary schools, also receive large subventions from the state, those of Paris and Versailles being considered rather higher in rank, and having a better paid staff of professors and teachers than those of the provinces. Colleges are establishments for intermediate education, maintained at the charge of the local municipalities, but without any aid from the central government, except the occasional endowment of special chairs and the partial support of a few professors. Primary instruction is everywhere throughout France gratuitous.

Germany.—The German elementary schools are divided into (1) those with three or more classes; (2) schools with two teachers; and (3) schools with one teacher, either with one class or half-day schools. Eighty is recognized as the maximum number of scholars under one teacher, even under the most unfavorable conditions. The compulsory laws as to ordinary school attendance are enforced from the age of 6 to that of 14, but generally if a child at 14 fail to reach the proper standard, he may be compelled to attend either another year at the day-school, or at a supplementary school in the evening or on Sunday. Fines for non-attendance are imposed, and the agency of the police is called into requisition to force the child of a negligent parent to attend school.

For the development of educational systems in other countries, see their respective titles and in the United States see under the various States.

EDUCATION, COMMERCIAL. Shortly before the Civil War private business colleges were established in the United States. Their purpose was to train men for active business work, but it was some time before their curriculums eliminated many of the subjects more properly belonging to an academic education. About 1884 the Wharton School of Finance and Economy was founded as a part of the University of Pennsylvania, and a regular four-years' course leading to a baccalaureate degree was instituted. While other colleges, notably Harvard, Dartmouth, Columbia, and the various State universities, have established courses in commercial education, the University of Wisconsin is the only one of a few to follow the examples of the University of Pennsylvania and make the business course one on the completion of which the degree of Bachelor of Science can be secured. The high schools followed suit and began to give courses similar to those offered in the private business colleges. In a few of the universities commercial education is offered as a graduate professional course. This is the case at the Harvard School of Business Administration and the Tuck School at Dartmouth. Some colleges have organized evening courses in business education; those situated in large cities particularly. Columbia University now has a three-years' evening course preparing students to take the State examination for the certificate of Certified Public Accountant.

Teachers of business law and administration are now members of the National Education Association, and there are many societies organized to further and improve the work of commercial education. The most prominent of these are the Eastern Commercial Teachers' Association and the National Federation of Commercial Teachers.

Commercial education was well developed in Europe before it was begun in the United States. Saxony in the 18th century and Paris in 1820 had founded schools of commerce. Germany quickly seized upon the idea and developed it until, in the 19th century, she led the world in this as in other forms of education. Higher schools of commerce, the equivalent of our university courses, were founded in Leipzig, Cologne, Frankfort, and Berlin, while many schools for the education of those between the ages of fourteen and eighteen were established. Antwerp, Venice, and Vienna also have higher schools of commerce. In England the task of training in business law and administration was taken up by the new universities established in the great industrial centers, such as Bir-

mingham, Leeds, Manchester, and Liverpool. It was not until after the Great War that any provision for such education was made at the ancient universities of Oxford and Cambridge. A notable contrast between the secondary schools of commercial education in Europe and those in the United States has been that in the former the leading business men organized in the various chambers of commerce have had a leading part in establishing and directing the schools. In the United States the business men have held aloof and allowed the work to be carried on by teachers equipped with more or less traditional academic training. This has not always been to the advantage of the subject.

EDWARD THE CONFESSOR, son of Ethelred, succeeded Hardicanute in 1041. Having been reared in Normandy, he brought over many of the natives of that country, whom he preferred at his court, which gave great disgust to his Saxon subjects. Notwithstanding this, he kept possession of his throne, and framed a code which is supposed to be the origin of the common law of England. He abolished the tax of danegelt, was the first who pretended to cure the king's evil by touch, and restored Malcolm to the throne of Scotland, which had been usurped by Macbeth. He consulted William of Normandy about the choice of a successor, and this afterward furnished that prince with a plea for invading the kingdom after the death of Edward, in 1066.

EDWARD I. (Norman line), surnamed Longshanks; born in 1239, succeeded his father, Henry III., in 1272. At the time of his father's death he was in Palestine, fighting against the Saracens for the recovery of Jerusalem, and when he returned, completed the conquest of Wales and subdued Scotland. To preserve Wales, he caused his son, who was born in Cærnarvon, to be called the "Prince of Wales," which, ever since has continued to be the title of the eldest son of the King of England. In endeavoring to break the spirit of the Scotch, he was unsuccessful, the patriotism of Wallace and his followers completely baffling his attempts at the entire subjugation of that people. He died in 1307. While in the Holy Land, Eleanor, the wife of this sovereign, saved his life by sucking the poison from a wound which he received from a vengeful assassin. She was the daughter of Ferdinand III., King of Castile. His second wife was Margaret, daughter of Philip the Hardy, King of France. The laws which he framed entitle him to the name of the English Justinian.

EDWARD II., son of the above, was created Prince of Wales in 1284, and after his accession to the throne suffered himself to be governed by his favorites, Gaveston and the Spencers, which occasioned the barons to rise against him. In his reign the battle of Bannockburn was fought near Stirling, in Scotland, which restored to that country whatever of her independence she had lost in the previous reign. In 1327, he was deposed by his subjects, and his crown conferred on his son, when he was confined in Berkeley Castle, Gloucestershire, where he was murdered in 1327.

EDWARD III., eldest son of Edward II. and Isabella of France; born in 1312, succeeded to the throne on the deposition of his father. Though a regency was appointed, the chief power was held by the queen and her paramour, Roger Mortimer, Earl of March. In 1330, Edward assumed the government, had Mortimer seized and hanged, and imprisoned Queen Isabella. In 1333 he invaded Scotland, and defeated the regent at Halidon Hill. The greater war with France soon withdrew his attention from Scotland. He assumed the title of King of France, invaded the country from Flanders, but without any successful result, renewed the invasion in 1340, when he defeated the French fleet at Sluys, besieged Tournay, and concluded a truce. The war was renewed, and another truce made in 1343, to be broken the following year. In 1346 he won the great victory of Crécy, took Calais in 1347, and concluded another truce. During his absence in France, the Scots invaded England, and were defeated at Nevil's Cross, David II. being taken prisoner. In 1356 Edward the Black Prince invaded France, and gained the victory of Poitiers, taking the French king and his son prisoners. The king was released after four years, on the conclusion of the peace of Bretigny. David of Scotland was released for a heavy ransom in 1357. War broke out again with France in 1369, and in 1373 John of Gaunt marched without resistance from Calais to Bordeaux. The long wars of Edward III., though almost fruitless of practical result, appear to have been popular; and his numerous parliaments granted liberal supplies for carrying them on, gaining in return confirmations of the Great and other charters, and many valuable concessions. His victories raised the spirit and also the fame of his country, and with the evident military power of England grew also her commerce and manufactures. In this reign Wyclif began his assault on the Church of Rome; the Order of the Garter was instituted;

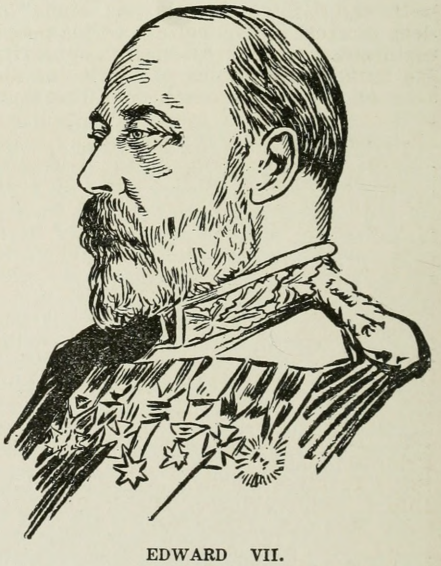
cannon began to be used in war; and the first English gold coin was struck. Edward died in Shene, now Richmond, June 21, 1377. By his queen Philippa, daughter of William III., Count of Holland and Hainault, he had six sons and five daughters.

EDWARD IV., son of Richard, Duke of York, succeeded Henry VI. in 1461. He came to the throne in the midst of the fierce struggle between the Yorkists and Lancastrians, in which he greatly distinguished himself by his courage and military skill. He won a great victory over the Lancastrians at Northampton, in July, 1460, and a second at Mortimer's Cross, in February, 1461; after which he marched on London, and was proclaimed. A few weeks after his accession he defeated them a third time at Towton, in Yorkshire. The war continued with varying fortunes till 1464. In the same year he married Lady Elizabeth Grey, which so disgusted the Earl of Warwick, commonly called the king-maker, that he joined the Lancastrian party, and the civil war was recommenced. Warwick defeated Edward's forces near Banbury in 1469. Soon afterward Warwick fled to France, from whence he returned with a supply of troops, and proclaimed Henry. Edward escaped beyond sea, and Warwick released Henry from the Tower, and set him on the throne; but Edward returned with succor, and marched to London, where he took Henry prisoner. He shortly after won the battle of Barnet, in which Warwick fell. Another victory at Tewksbury secured to him the quiet possession of the throne. Preparations were made for war with France, and an expedition sent, which was, however, fruitless. War broke out also with Scotland, but nothing of importance occurred. In 1478 Edward had his brother, the Duke of Clarence, condemned and put to death as a traitor. Clarence had married Isabel, daughter of the Earl of Warwick, and had taken part with him against the king. He died in 1483.

EDWARD V., son of the preceding whom he succeeded at the age of 12 years, was smothered, with his brother, in the Tower, by order of their uncle and guardian, Richard, Duke of Gloucester, in 1488.

EDWARD VI., the only son of Henry VIII., by his queen, Jane Seymour; was born in 1537. He succeeded his father in 1547, but by reason of his tender age and early death, had little to do with the important measures that mark his reign. His uncle, the Earl of Hertford, was named protector, and created Duke of Somerset; but in 1549 his place was taken by Dudley, Earl of Warwick, created Duke of Northumberland; and Somerset, two years later, was charged with treason and felony, and beheaded. Both of these, however, carried on the work of the Reformation. Somerset made an expedition into Scotland, and gained the victory of Musselburgh, or Pinkie, in 1547; Warwick defeated the insurgents under Ket, the Norfolk tanner, in 1549; a very severe law was passed against vagabonds, but had to be soon repealed. The Act of Six Articles was repealed, and the use of the Book of Common Prayer established. The great aim of Northumberland was to secure the succession to the throne of England for his family. With this view he married his son, Lord Guilford Dudley, to Lady Jane Grey, and obtained from the weak and dying Edward, a document settling the succession on Jane Grey, to the exclusion of Mary and Elizabeth. He died in 1552.

EDWARD VII., King of the United Kingdom of Great Britain and Ireland, and of all the British Dominions beyond the Seas, Emperor of India, born in Buckingham Palace, London, on Nov. 9, 1841. He was the second child and the eldest son of Queen Victoria and Albert, Prince



EDWARD VII.

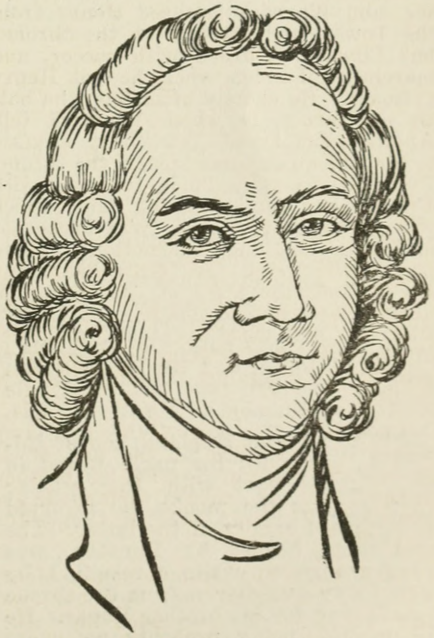
Consort. He was christened Albert Edward. He was made Prince of Wales at his birth and as heir to the throne succeeded to many other titles. He was educated privately and among his tutors was Charles Kingsley. He attended Edinburgh University for one session,

Christ Church, Oxford, for one year; and Cambridge University for four terms. In 1860 he traveled throughout the United States and Canada and in the year following made a tour of the Orient, accompied by Dean Stanley. In February, 1863, he took his seat in the House of Lords, and on March 10 of the same year married Princess Alexandra, eldest daughter of King Christian IX. of Denmark. In the years following he made, in company with the Princess, tours of various parts of the Empire where he was everywhere enthusiastically received. On account of the virtual retirement of Queen Victoria he became leader of British society and represented the Crown at all important functions. His genial disposition and democratic bearing made him a universal favorite. He became King upon the death of Queen Victoria, on Jan. 2, 1901. The coronation was set for Jan. 26, 1902, but the king was seized with a severe illness and it was postponed until Aug. 9 of the same year. On his accession to the throne Edward at once took a prominent part in European politics, devoting himself especially to the maintenance of European peace. He interchanged many visits with the German Emperor, with the Czar of Russia, and with the President of France. He also maintained most cordial relations with the United States. At home his deep interest in the welfare of his people maintained and increased his popularity. He founded the Order of Merit for distinction in war, science, and literature and the service of man. The political situation, especially the measures for tax reform and the crisis in the House of Lords caused him much anxiety in 1910. He died unexpectedly on May 6 of that year from heart failure following a bronchial attack. After lying in state for three days at Westminster Hall the body of the King was buried at Windsor. The funeral was notable for the attendance of sovereigns and of important public men from all the countries of the world. Six children were born to King Edward and Queen Alexandra: Prince Albert Victor, born Jan. 8, 1864, died Jan. 14, 1892; Prince George, born Jan. 13, 1865; Princess Louisa Victoria, born Feb. 20, 1867; Princess Victoria Alexandra, born July 6, 1868; Princess Maude Charlotte, born Nov. 26, 1869; and Prince Alexander John, born April 6, 1871. He died on the following day.

EDWARD, PRINCE OF WALES, surnamed the Black Prince from the color of his armor, was the eldest son of Edward III.; was born in 1330. In 1345 he accompanied his father in his expedition to France, and displayed unusual heroism at the battle of Crécy: In 1356 he gained the battle of Poitiers, and brought the French king and his son prisoners to England. He died before his father, in 1376, leaving two sons, the elder of whom, Richard, was the successor of Edward III.

EDWARDS, GEORGE WHARTON, an American artist, born in Fairhaven, Conn. He received an academic education in Antwerp and Paris. From 1898 to 1903 he was director of the art department of Collier's "Weekly," and from 1904 to 1912 was manager of the art department of the American Bank Note Company. He received medals for excellence of work in drawing and painting at many expositions. He painted the mural decoration "Henrick Hudson," at the United States Military Academy. He wrote fiction as well as books on art subjects. These include "Thumbnail Sketches" (1886); "Holland of Today" (1909); "Some Old Flemish Towns" (1911); "The Forest of Arden" (1914); "Alsace-Lorraine" (1918); and "Holland of Today" (1919).

EDWARDS, JONATHAN, an American theologian; born in East Windsor, Conn., Oct. 5, 1703. He was the son of Timothy Edwards, a Congregational



JONATHAN EDWARDS

minister, and was himself minister at Northampton, Mass., from 1727 to 1750. From 1751 to 1758 he was an Indian

missionary, and at the time of his death was president of the College of New Jersey (now Princeton University). His works are the recognized exponents of essential Calvinism next to those of its founder, and rank high in the theological metaphysic of all time. They include among others: "An Inquiry Into the Modern Prevailing Notions Respecting that Freedom of the Will Which Is Supposed to Be Essential to Moral Agency" (1754); "The Great Christian Doctrine of the Original Sin Defended" (1757?) and "A Dissertation Concerning the End for Which God Created the World" (1789). He died in Princeton, N. J., March 22, 1758.

EDWARDSVILLE, a city of Illinois, the county-seat of Madison co. It is on the Wabash, the Illinois Traction, the Toledo, St. Louis and Western, the Litchfield and Madison, and the St. Louis, Troy and Eastern railroads. The city is the center of an agricultural and coal mining region, and has manufactures of tools, plumbing supplies, brass finishings, radiators, buggies, etc. There is a public library. Pop. (1910) 5,014; (1920) 5,336.

EDWARDSVILLE, a borough of Pennsylvania, in Luzerne co. It is on the Delaware, Lackawanna and Western railroad, and is entirely a residential suburb of Wilkes-Barre. Pop. (1910) 8,407; (1920) 9,027.

EDWIN, King of Northumbria, was the son of Ælla, King of Deira, who died in 588. His father died when he was but 3 years old, whereupon Æthelric, King of Bernicia, seized his territories. The child was carried into north Wales, and there brought up. At length he found refuge with Rædwald, King of East Anglia, who took up arms on his behalf against Æthelfrith, the son of his oppressor, and defeated him in a great battle, in which the usurper fell (617). Edwin now obtained his father's kingdom of Deira, and ere long overran Pernicia, thus bringing under his rule a united Northumbria. He died in 634.

EDWY, King of England, son of Edmund I., succeeded his uncle Edred in 955. Taking part with the secular clergy against the monks, he incurred the confirmed enmity of the latter. The papal party, headed by Dunstan, was strong enough to excite a rebellion, by which Edwy was driven from the throne to make way for his brother Edgar. He died in 959, being probably not more than 18 or 19 years old.

EEL, the general name of a family of teleostean fishes belonging to the apodal section of the *Malacopterygii*. They belong to various genera. The genus *Anguilla* is characterized by its serpent-like elongated body, by the absence of ventral fins, and the continuity of the dorsal and anal fins round the extremity of the tail. The dorsal fin commences half-way between the head and the anal fin, and the lower jaw projects beyond the upper. In the genus *Conger*, which is conclusively marine, the dorsal fin commences above the pectoral, and the upper jaw is the longer. The smoothness of the body—the scales being inconspicuous—and the serpentine movements of eels are proverbial. The conger and at least three other species—the sharp-nosed, the broad-nosed, and the snig—belong to Great Britain. The species of the genus *Anguilla*, which are both freshwater and marine, seldom exceed 30 inches in length.

In England river eels are caught in great numbers by means of eelbucks or eelpots. A kind of trident is used also for taking them, called an eelspear. Eels avoid cold, and frequently migrate in winter to the mud or brackish water estuaries where the temperature is higher. They have even been met with in large numbers performing migrations on land, mostly intervening necks of soil covered with damp grass. Some eels spawn in the estuaries of rivers, and immense numbers of the young eels pass up the streams in spring, their passage in England being called the eel-fare.

EGAN, MAURICE FRANCIS, an American author; born in Philadelphia, May 24, 1852; was graduated at La Salle College. Subsequently he was Professor of English Literature in the University of Notre Dame, Ind., and Professor of English Language and Literature in the Catholic University of America in Washington, D. C. He was appointed U. S. Minister to Denmark in 1907. His experiences in that post he described in "Ten Years on the German Frontier" (1919). He is the author of 30 books, including: "That Girl of Mine" (1879); "Preludes" (1880), a book of poems; "Songs and Sonnets" (1885); "Stories of Duty" (1885); "A Garden of Roses" (1886); "The Life Around Us" (1886); "Everlasting St. Francis" (1912), etc.

EGEDE, HANS (ā'ge-de), the apostle of Greenland; was born in 1686 in Norway. In 1721 he set sail for Greenland with the intention of converting the natives to Christianity, and for 15 years performed the most arduous duties as missionary, winning by his persevering

kindness the confidence of the natives. In 1736 he returned to Copenhagen, where he was made a bishop and director of the Greenland missions. He died in 1758. His son, PAUL EGEDE, born in 1708, followed in his father's footsteps, became Bishop of Greenland, and died in 1789.

EGG, a mass or speck of protoplasm developed in the females of all but the lowest animals and when impregnated with the corresponding substance of the opposite sex capable of producing organisms like the parents. The egg throughout the animal kingdom is, in the last analysis, one single perfect cell, in which there are four parts, the cell wall, the cell substance, the nucleus and the nucleolus. The eggs of animals lower than the reptile have usually only three parts, viz., the germinal spot or dot, the germinal vesicle, and the vitellus or yolk; the first being contained in the vesicle, and that again in the yolk. Such eggs are usually of microscopic size and before being impregnated do not differ from any other cell or from the whole of a single-celled animal. The parts of an egg named are in general terms the same as those used for cells, but each part has its special name. Thus the nucleolus, the smallest recognizable constituent, is called the germinal spot or spot of Wagner because it was discovered by Wagner in 1836. The nucleus is called the germinal vesicle or vesicle of Purkinje because it was discovered by Purkinje in 1825. The common cell substance or protoplasm is called the vitellus or yolk and the cell wall is called the vitelline membrane. Some eggs have other regular constituents as, for instance, a quantity of colored albumen or food yolk, like that constituting the yellow of a hen's egg. Secondly, a quantity of colorless albumen, called the white of the egg, which usually coagulates when warm and is used in photography for preparing the paper. Thirdly, the egg-shell which, especially in birds, consists of a membrane coated with carbonate of lime and in the eggs of reptiles possessses the appearance and consistency of parchment. The white and the yellow of eggs are inclosed in the shell wall which, as it increases in size, attains a special thickness and toughness and is called the egg-pod or putamen.

Under the term egg is included the ovum of every kind of mammal; but in general the English term egg is used only of those animals that do not produce their young alive. All animals differentiated by sex lay eggs. Those in which the egg passes out of the body and is hatched outside are called oviparous, those in which the egg remains inside the body to hatch are called ovoviviparous; those whose eggs are retained in connection with the parent by means of a placenta and an umbilical cord so that the young are brought forth alive are called viviparous. Through repeated division of the germinal vesicle a multitude of cells is formed out of which the embryo is developed. In the case of birds, reptiles, and the majority of insects, the young is nourished in the egg by means of the albumen there stored so that after the egg is laid the development continues till the animal hatches out. Eggs the whole of whose yolk makes up into the body of the embryo are called holoblastic. Others with food yolk which does not undergo segmentation are meroblastic. Birds' eggs are meroblastic. All birds lay eggs and so also do most reptiles, amphibians, and fishes; insects, crustaceans, and mollusks are oviparous. In this class are included the ornithorhynchus and echidna. The eggs of amphibians are usually found in floating glutinous masses. The eggs of fishes are popularly known as roe or spawn.

Eggs vary vastly in size. The ova of mammals are usually spherical and microscopic. The human ovum is among the smallest known, being a minute spherical body from 1-120 to 1-125 of an inch in diameter, while the largest known egg is that of the extinct elephant bird *Epyornis Maximus* of Madagascar, the shell of which had a capacity of about two gallons and was six times the size of the egg of the ostrich. The eggs of birds, especially of fowls and some reptiles, as turtles, are commonly used for food. A hen's egg of good size weighs about 1,000 grains, of which the white constitutes 600, the yolk 300, and the shell 100. There are generally 10.7 parts shell, 11.9 parts albumen, 12.8 parts fat, .7 parts salt, and 63.9 water. Besides their use as a food, hen's eggs are used in the technical arts, the albumen in which they are so rich serving in dying, manufacture of leather, and various other purposes. The science of birds' eggs is called oölogy.

EGG, one of the Hebrides Islands.

EGGLESTON, EDWARD, an American author; born in Vevay, Ind., Dec. 10, 1837. In fiction he has achieved celebrity with stories of life in southern Indiana in pioneer days. His works include: "The Hoosier Schoolmaster"; "The Circuit Rider"; "Roxy"; "The Graysons"; "The Faith Doctor"; "The Hoosier

Schoolboy"; "Queer Stories for Boys and Girls"; "Schoolmasters' Stories"; "Mr. Blake's Walking-Stick"; "Duffels"; "School History of the United States"; "Household History of the United States"; "First Book in American History"; "The Beginners of a Nation," the first volume of a "History of Life in the United States"; etc. He died in 1902.

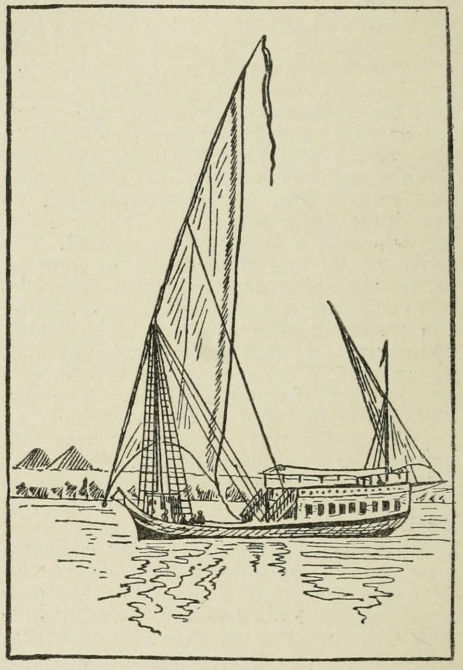
EGGLESTON, GEORGE CARY, an American author; brother of Edward; born in Vevay, Ind., Nov. 26, 1839. He has long been connected in an editorial capacity with one or another New York newspaper, including the "World," the "Evening Post," and the "Commercial Advertiser." A few of his many books are: "A Man of Honor"; "A Rebel's Recollections"; "Red Eagle"; "Juggernaut" (with Dolores Marbourg); and for young people: "How to Educate Yourself"; "How to Make a Living"; Our First Century" (1905); "Recollections of a Varied Life" (1910). He died in 1911.

EGMONT, PORT, the principal harbor of the Falkland Isles, on the N. coast of the more W. of the principal two islands of the group, its seaward barriers being the islets of Keppel and Saunders.

EGYPT, a country in the N. E. of Africa, extending from the Mediterranean to the first cataract of the Nile at Assuan, from 24° 6′ to 31° 36′ N. lat. Area, exclusive of the Sudan, 350,000 square miles. Population (1917) 12,750,918, exclusive of nomad Bedouins. Capital, Cairo; pop. (1917) 790,939. Geologically and ethnologically, it is confined to the bed of the flooded Nile and occupies little more than 11,000 square miles. The Nile, after breaking through the rocky barrier at Assuan, pursues a N. course, varied only by one considerable bend near Thebes, till, a few miles N. of Cairo, it divides into two main streams, terminating in the Rosetta and Damietta mouths, through which, after a course of 3,300 miles, it pours during "high Nile," about 700,000,000,000 cubic meters daily into the Mediterranean Sea. The other five mouths which existed in antiquity, have silted up; the triangular district inclosed by them, supposed by the ancients to have been recovered from the sea, formed the delta, now called Lower Egypt.

Climate.—The climate is remarkably mild, especially S. of the desert. The temperature in winter in the shade averages 50° to 60° F., and in the heat of summer 90° to 100° in Lower Egypt, 10° higher in the upper valley. From June till February cool N. winds prevail, then till June comes a period of E. or hot S. sandwinds, called the Khamasin or "Fifties" (blowing 50 days). The most remarkable phenomena is the regular increase of the Nile, fed by the fall of the tropical rains. The state of the Nile marks the season more accurately than the variation of temperature. Except in the dry air of the valley and desert, Egypt is not remarkably healthy; because of the occasional visitations of plague and cholera, ophthalmia, diarrhœa, dysentery, and boils.

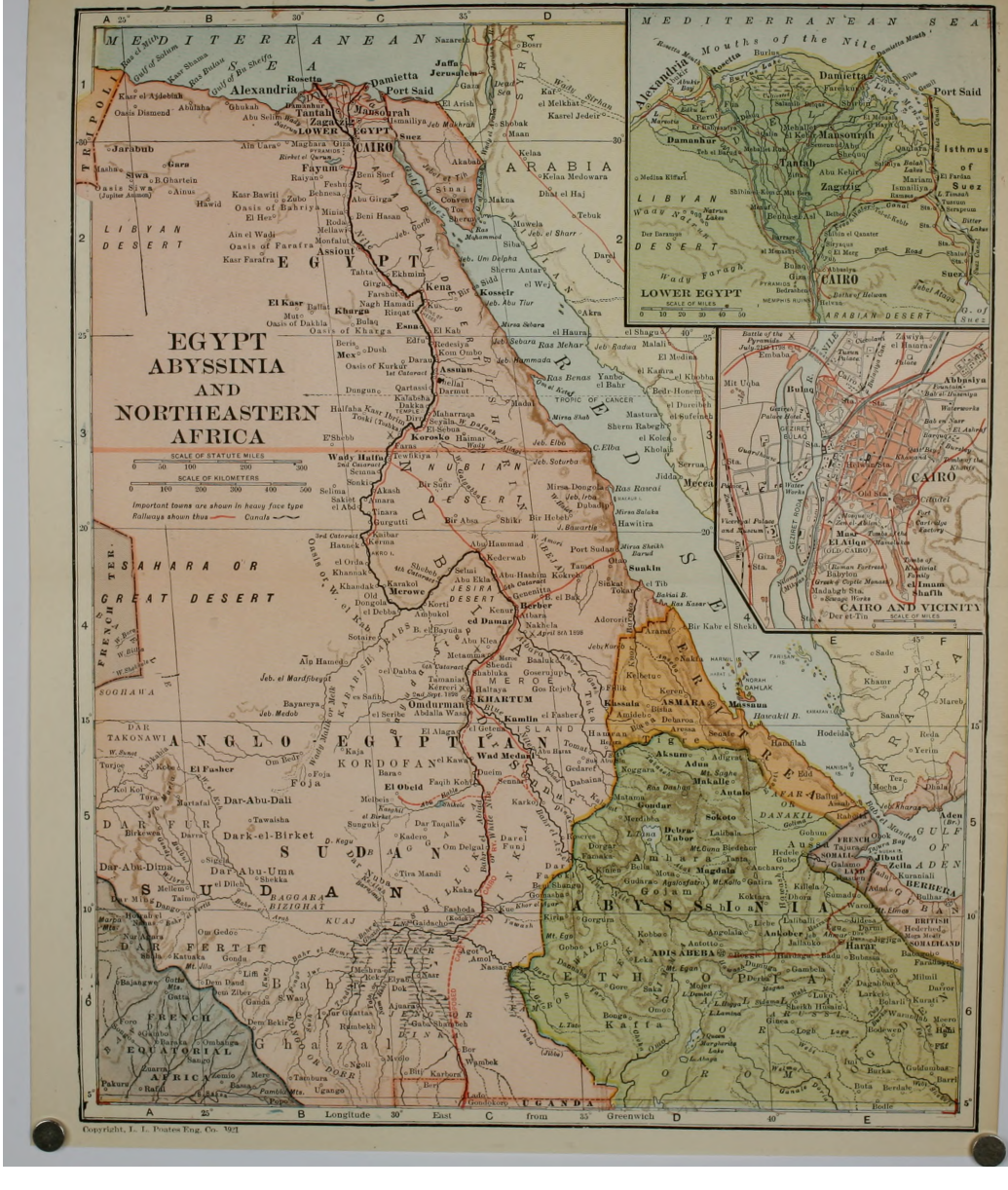
Geology.—Egypt is separated from Nubia by a low hilly region about 50 miles broad from N. to S. and composed



A DAHABEAH OF THE NILE, EGYPT

of granitic rocks. The same crystalline rocks extend up the shore of the Red Sea to near the opening of the Gulf of Suez, stretching inland for fully 30 miles. The scenery in this district is wild and rude. The granitic region terminates at Assuan, the ancient Syene, whence most of the materials for the colossal monuments of Egypt were procured. The Arabian and Libyan ranges, on the right and left of the river, are alike composed of cretaceous strata, the predominant rock being sandstone, which is durable and easily worked.

Natural History.—The signal peculiarity of the vegetation of the Nile Val-



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ley is the absence of woods and forests. The Pharaohs got their timber chiefly from Lebanon, and modern Egypt is supplied from the forests of Asia Minor. Of flowers, the celebrated lotos, or water-lily, has supplied many ideas to Egyptian architects. The lack of jungle or cover of any sort accounts for the poverty of the Egyptian fauna; the crocodile, like the hippopotamus, is beating a retreat to the tropics. The ordinary beasts of burden are the ass and camel. Serpents are numerous, and among them the dreaded cobra and the cerastes. The Nile is full of fish, of rather poor flavor. Egypt is an agricultural country; in some parts, by the aid of regulated artificial irrigation, the rich alluvial deposit will bear three crops in the year. Wheat is the chief cereal;



STREET IN CAIRO, EGYPT

barley, maize, durra, beans, lentils, and clover are also largely grown with very little trouble. The extensive culture of papyrus, which anciently supplied material for paper, has in modern times been superseded by that of sugar cane, cotton, indigo, and tobacco.

Religion.—The two main principles on which the religion of Egypt was based appear to have been the existence of an Omnipotent Being, whose various attributes being deified, formed a series of divinities; and the deification of the sun and moon. Each group of divinities formed a triad composed of a chief male deity, with a wife or sister and a son, as Osiris, Isis, and Horus, or Amun, Maut, and Khonso. Among the other gods of the Egyptian Pantheon are Ra, the sun, usually represented as a hawk-headed man; Mentu and Atmu are merely two phases of Ra, the rising and setting sun. The worship of the bull Apis is connected with Osiris. Serapis is the defunct Apis, who has become Osiris. Seth or Set represents the power of evil. Ammon (Egyptian Amen), originally a local god, owed his importance to the greatness of his city, Thebes. Thoth was the chief moon-god, and is generally represented as ibis-headed. Anubis, the jackal-headed, belonged to the family of Osiris, and presided over mummification. Besides these deities, the Egyptians worshiped beasts, reptiles, and even vegetables, probably as symbols.

Ancient Civilization. — When the Egyptians first appeared in history, they were already possessed of a marvelously advanced civilization, which presupposes thousands of years of development, even before the remote period, nearly 4000 B. C., when the pyramid builders reigned. In the sciences, as early as the 4th dynasty the notation of time, and the decimal system of numbers, weights, and measures, and the division of the year were already known, while the form of the buildings implies a knowledge of geometry and its sister sciences. They had also a knowledge of astronomy and chemistry. The art of literary composition existed as early as the 4th dynasty. The language of the period, though concise and obscure, was, nevertheless, fixed. Architecture had attained great refinement. The transport of enormous blocks of stone testifies to an early development of engineering skill. The statues of the 4th dynasty, carved nearly 4,000 years B. C., were generally conventional, owing to their employment in architecture; but in portraiture great perfection was attained. Painting appeared at the same age chiefly in tempera or whitewashed surfaces, though fresco was occasionally used. In the art of music, the harp and flute appear in use as early as the 4th, and heptachord and pentachord lyres as early as the 12th dynasty; besides which drums, tambourines, flutes, cymbals, trumpets, and guitars are seen in the 18th, and the natural instrument, the jingling sistrum, in the 4th. Poetry was at all times in use.

The civil government was administered by the three highest professions; the priests were distinguished by their

superior knowledge, cleanliness, and godliness, and the political and civil government was administered by royal scribes, or secretaries of state, who superintended the revenue, justice, foreign affairs, and all the interests of the executive. Sacred scribes attended to the ecclesiastic interests, and inferior scribes to the local interests. The public works, the collection of grain and of all the linen dues, the cattle, workmen, wells, irrigation, had each their separate superintendents and scribes. The military force, of 410,000 men, at a later period, comprising all arms of the service, was ruled with severe discipline, under the direction of nomarchs, colonels, captains, and lieutenants.

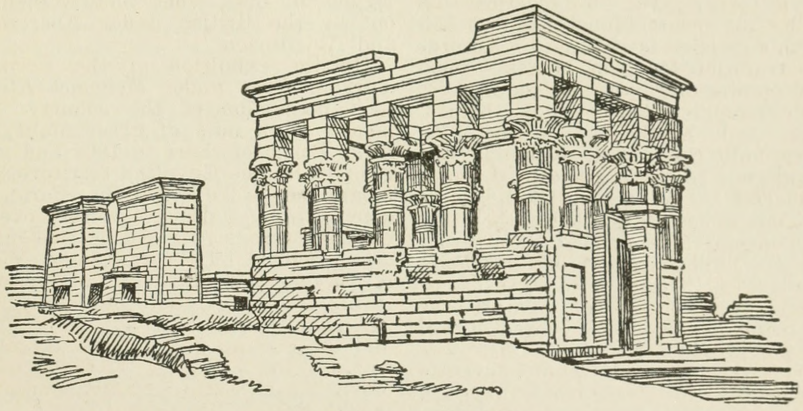
History.—The Egyptians are the earliest people known to us as a nation, if we except the Chinese. When Abraham entered the delta from Canaan, they had long been enjoying the advantages of a settled government. The arrangement of Egyptian chronology is still a much-disputed point. A list of the kings of Egypt, arranged in 30 dynasties, was given by the priest Manetho about 250 B. C.; this division is still used. According to tradition Mena or Mones formed the old empire of Egypt and founded its capital Memphis. Three kings, Khufu, Khafra, and Menkaura, of the 11th dynasty, built the largest pyramids; the date assigned to these kings by Lepsius is 2800-2700. The shepherd kings were driven out about 1600. With their expulsion began the reigns of those great rulers who built the magnificent temples and palaces at Thebes. Rameses II., or Sesostris, was successful against the neighboring Arabs, and covered Egypt with magnificent buildings. He was probably the Pharaoh who oppressed the Hebrews; the Exodus may have occurred under his son and successor, Maneptah or Merenptah. Under the later Ramessides the Egyptian empire began to decay. Eventually the Ethiopians under Shabak (Sabako) conquered Egypt. For a time it was subject alternately to Ethiopian and Assyrian princes, but in the 7th century the kings of Sais once more restored its independence and prosperity. About 525, Cambyses, King of Persia, overran Egypt, and it remained a Persian province till Persia was conquered by Alexander the Great, 332 B. C. Egypt now became a Greek state. Alexandria was founded as the new Greek capital. On Alexander's death, his general, Ptolemy, took possession of the throne and became the first of a Greek dynasty which for 300 years made Egypt one of the chief kingdoms of the world. Ptolemy Auletes went to Rome to ask help against his subjects, and the famous Cleopatra maintained her power only through her personal influence with Julius Cæsar and Mark Anthony. On the defeat of Mark Anthony by Augustus, 30 B. C., Egypt became a province of Rome. Next arose in Alexandria the Christian catechetical school, which produced Clemens and Origen. On the division of the Roman empire (A. D. 337), Egypt became a province of the Eastern Empire and sank deeper and deeper in barbarism and weakness. It was conquered in 640 A. D. by the Saracens under Caliph Omar. As a province of the caliphs it was under the government of the famous Abbassides. The last dynasty was overthrown by the Mamelukes (1250); the Mamelukes in their turn were conquered by the Turks (1516-1517). The Mamelukes made repeated attempts to cast off the Turkish yoke. Bonaparte led an army of 35,000 French, and defeated them at the battle of the Pyramids, July 23, 1798. The French held Egypt till 1801, when they were driven out by the British under Abercrombie and Hutchinson.

On the expulsion of the French a Turkish force under Mehemet Ali Bey took possession of the country. Mehemet Ali, a man of great ability, was made Pasha of Cairo in 1804 and greatly extended the Egyptian territories. At length he broke with the Porte, and after gaining a decisive victory over the Ottoman troops in Syria he was in 1839 acknowledged by the Sultan as Viceroy of Egypt, with the right of succession in his family. Under the rule of Said, one of his sons, railways were opened and the cutting of the Suez Canal was begun. In 1882 the "National party" under Arabi Pasha revolted and forced the khedive to flee. On July 11 a British fleet bombarded Alexandria and restored the khedive, and at Tel-el Kebir Arabi's forces were totally crushed on September 13. A rebellion in the Sudan under the leadership of Mohammed Ahmed, the so-called mahdi, now gave the government trouble. In 1883 the mahdi's forces annihilated an Egyptian force under Hicks Pasha in Kordofan. British troops were now dispatched to Suakim and inflicted two severe defeats on the mahdi's followers there. But the British cabinet had resolved to abandon the Sudan; and General Gordon, famous for his work in this district, was sent to effect the safe withdrawal of the garrisons (1884). By this time, the mahdi's forces were strong enough to shut the general up in Khartum. For nearly a year he held the town, but was

assassinated (January, 1885) before the relief expedition under Sir Garnet Wolseley could reach him. In 1889, Egypt was invaded by 14,000 dervishes, under Wad el N'Jumi, and this army was destroyed at Toski by an Anglo-Egyptian force under General Grenfell. There was no effort to relieve the Sudan from the tyranny of Abdullahi, the mahdi's successor, till 1896, by which time the fanatical faith of the dervishes had decayed and many tribes had become disloyal. Slatin Pasha, who escaped from Omdurman in March, 1895, revealed at Cairo the altered situation, and during the following winter the British Government, as the protector of Egypt, resolved on the reconquest of the Sudan. General Kitchener was given control of the undertaking. In June, 1898, he attacked an army of 18,000, under Mahmud, sent against him, practically annihilated it, and by September 1 arrived in sight of Omdurman. The khalifa attacked, but was repulsed with the loss of almost his entire line of battle. Ascending the Nile with gunboats after the battle, Kitchener found Captain Marchand holding Fashoda, which he had seized by order of the French Government. Under threats of war from England, Marchand was in November ordered to evacuate Fashoda.

In 1904, an agreement was made between France and Great Britain, by which France pledged itself to permit Great Britain a free hand in the occupation of Egypt. A movement for Egyptian nationalism developed in the early part of the 20th century, and continued to grow in importance. The Nationalist party was formed with Mustapha Kemal as leader, and various conflicts with the English officials gave strength to the Nationalist movement. The strong hand of Lord Cromer, the British viceroy, prevented, however, any actual outbreak. Under Lord Cromer's rule, great strides were made in the economic and social development of the country. He resigned in 1907 and was succeeded by Sir Eldon Gorst. He made it evident from the beginning of his rule that Great Britain intended to maintain her hold in the country, and there were general manifestations of dissatisfaction, including the assassination of the Egyptian Prime Minister. The government took repressive measures which were effective. In 1911 Sir Eldon Gorst died and was succeeded by Lord Kitchener, who at once undertook the pacification of the country by economic reform.

At the outbreak of the World War, Great Britain at once declared Egypt to be a British protectorate, thus ending the suzerainty of Turkey. Sir Arthur McMahon was appointed High Commissioner. Abbas Hilmi was removed as Khedive, and was succeeded by his father's brother, Hussein Kemal, who was made Sultan. The measures undertaken and carried on by Lord Kitchener had proved remarkably beneficial. These included constitutional reforms, and extensive changes in the judicial procedure.



TEMPLE OF PHILÆ, EGYPT

The Suez Canal was one of the vital points of defense. At the outbreak of the war, ways and means were taken to strengthen it on the anticipation of a strong attack against it. These fears were realized. Turkish forces undertook a campaign against the canal in January, 1915. They were commanded by German officers.. The attacks were repelled with great losses and the army under the Turks withdrew to Palestine. Although this prevented for a time at-

tacks on the canal, military operations continued and several important battles were fought. The chief of these was at Romani. The Turkish force was defeated by the English and Australian troops. Operations were carried on throughout this year under great difficulties, and the Sinai desert was finally cleared of Turkish troops. During the progress of the war, the Egyptian Nationalists continued to cause trouble and demanded permission to submit their claims to the British Government. In 1919 the Nationalists placed obstacles in the way of the formation of a new government. British officials were forced to deport the vice-president of the Assembly and three other leaders to Malta. This was followed by riots in several cities. In March, 1919, General Allenby, who had been appointed Special High Commissioner arrived in Cairo and at once released several revolutionists from prison and temporarily restored order. There were further outbreaks, but conditions had gradually readjusted themselves by the end of 1919. In spring of 1920 a mission headed by Lord Milner was sent to Egypt for the purpose of inquiring into conditions and recommending reforms. The Egyptian Nationalists had sent a delegation to the Peace Conference in Paris, but it was not given a hearing. The Milner mission concluded its work in April, 1920. It recommended several changes in the formation of government, including the retention of the Sultan as titular head, and the return of a bi-cameral legislature. It recommended that the Upper House should consist of members partly elected directly and partly nominated, and the Lower House should be entirely elected. A sweeping thorough remodeling of the Egyptian Government and a sweeping reduction of British officials was advised. The Nationalists continued disturbances and several of their leaders were arrested in July for an attempt to assassinate the Premier.

Law and Justice.—There are 90 summary tribunals, 8 central courts and a Court of Appeals at Cairo. "Cantonal" Courts composed of villaye notables—2,360. By an act of 1905, serious offenses, and by Act of 1910, press offenses, are tried at Central Courts.

Finances.—Revenue 1919-1920 (estimated) £28,850,000. Expenses: £28,850,000. In April, 1919, the sectional debt was £93,388,640. There is a National bank at Cairo, an Agricultural bank, 8 Mortgage banks and 5 ordinary banks, one P. O. Savings bank and 12 rural.

Education. — Of indigenous schools, known as "Maktabs" there were in 1918 3,534. Teachers, 6,582, attendance, 209,186. In 1919 under Government direction and of departments there were 275 schools. There are schools of law, military, agriculture, veterinary, police, and for cadis; a reformatory for boys and one for girls. The Azhar University at Cairo for higher education is the greatest Moslem institution of its kind in the world.

Agriculture.—In 1917 areas cultivable 7,932,077 feddans (=1.038 acre) cotton is the chief crop. 2,633,539 acres that could be reclaimed. In 1918, the wheat crop was 874,720 tons; barley 214,916 tons; and maize, millet and rice were also produced on a large scale. Cotton 5,019,689 gantârs (=99.05 lbs.).

Commerce.—Merchandise (1918) imports £51,155,306. Exports, £45,379,020. Imports from U. S. (1918) £491,326. Exports £4,286,318.

Communication. — In March, 1919, Egypt had 2,339 miles of rails, double and single. There were 726 miles of privately owned roads, exclusive of Sudan to Khartoum R. R.—375 miles. Telegraph and telephone systems, 6,311 miles. Post-offices and stations 2,485.

EGYPTOLOGY. See ARCHÆOLOGY.

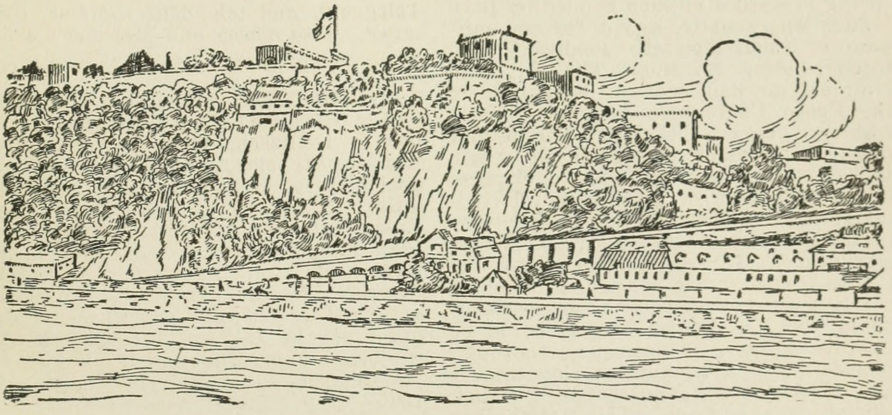
EHRENBERG (ā'ren-berg), **CHRISTIAN GOTTFRIED**, a German scientist; born in Delitzsch, April 19, 1795. After studying theology, medicine, and natural history, he joined in 1820 an expedition to Palestine, Egypt, and Abyssinia, returning to Berlin in 1825. In 1820 he accompanied Humboldt to the Ural and Altai ranges and to central Siberia. His great work on "Infusoria" appeared in 1838, and was at once recognized as the highest authority on the subject. It was followed in 1854 by his "Microgeology." He died June 27, 1876.

EHRENBREITSTEIN (ā'ren-brīt-stīn), a Prussian fortress of great strength situated opposite the confluence of the Moselle with the Rhine, on a precipitous rock 387 feet above the river, and inaccessible on three sides. It is connected with Coblenz on the opposite shore by a bridge of boats. After the Armistice, ending the WORLD WAR (*q. v.*), it was occupied by American troops.

EIDER (ī'der), a river of Prussia, which rises in Holstein, and forms the boundary between Schleswig and Holstein, falling into the North Sea at Tönning after a course of 92 miles. By its junction with the Schleswig-Holstein Canal it gives communication between the North Sea and the Baltic.

EIFFEL TOWER, THE, a notable structure in Paris, France. The plans

for the Paris exposition of 1889 included a monstrous iron tower, to be raised on the Champs-de-Mars, 1,000 feet high. The designer, Gustave Eiffel, constructed it of iron lattice-work, with three elevators giving access to the summit. The uses of so stupendous an undertaking are many, and it became one of the chief permanent ornaments of the city. Its importance from a meteorological point of view cannot be overestimated, the tower enabling meteorologists to study the decrease of temperature at different heights, to observe the variations of winds, and to find out the quantity of rain that falls at different heights, and the density of the clouds. Indeed, in all that relates to temperature, hygrometry, air currents and the composition of the air the tower affords opportunities for study and research, many of which have hitherto been impossible. It is equally useful to astronomers. In the World War (1914-1918) the tower was employed as a wireless telegraph station.



EHRENBREITSTEIN

EIGG (ĕg), an island on the W. coast of Scotland, County of Inverness, about 10 miles from the mainland, and 5 miles long by about 3 broad. It has bold, rocky shores, and terminates to the S. in a lofty promontory called the Scuir of Eigg, with a peak of columnar pitchstone porphyry 1,339 feet above the sea, and on one side perpendicular as a wall. It is the scene of the massacre, toward the end of the 16th century, of the Macdonalds by the Macleods of Skye, who suffocated them in a cave where they had taken refuge.

EIGHT-HOUR DAY, the period fixed by the demand of the international labor movement as the maximum length of a day's work. With the introduction of steam-driven machinery in England, in the early part of last century, together with the factory system, manufacturers gained almost autocratic control of the hundreds of thousands of workers at their disposal, and the length of a day's work reached the limits of human endurance. Twelve and fourteen hours were the average, while women and children were often compelled to work sixteen and eighteen hours a day. These and similar evils led to organization of the workers for protective purposes. Through their efforts, both by economic and political action, the working day was gradually shortened. The first demand for an eight-hour day was voiced in England as far back as 1833, and the British Trade Union Congress at Birmingham, held in 1869, presented it as one of its fundamental principles. In the United States the National Labor Union declared for an eight-hour day in 1866. During the period of so many strikes, 1872-1873, "eight-hour leagues" were a prominent feature of the labor disturbances of that time. This principle of limiting the day's work was fiercely fought by the manufacturers and other employers, who contended that it was a matter to be regulated only by employer and employee, without outside interfernce, but organized labor and its friends contended that the status of the single, unorganized workers was economically too weak to enable him to have a voice in regulating an agreement with his employer. It was the first step in "collective bargaining." In the matter of legislation as well as an employer of labor the Federal Goverrnment has taken the lead. In 1869 Congress enacted the first eight-hour law, applying it to the workers in the United

States navy yards. Now all workers directly employed by the Federal Government are similarly protected, and in 1912 Congress enacted a law making the eight-hour day a part of the contract with all private firms or employers working for the Federal Government, with some minor exceptions. Most of the States have passed similar legislation for their directly employed workers, and a large number have followed the example of the Federal Government in extending it to contract work. The tendency to enact and extend such legislation continues to increase; in 1919 seven States passed laws in this direction—Colorado, Kansas, Minnesota, Nebraska, Nevada, Wisconsin, and Wyoming. A smaller number of States have already begun to enforce the eight-hour day in private industry, notably for women and children and mine workers. Among these are Utah and North Dakota. Organized labor has enforced this standard with even more success; at the present time the eight-hour day is universal in the building and printing trades and in coal mining.

EIMEO (ī'me-ō), one of the French Society Islands, in the Pacific Ocean, about 10 miles W. N. W. of Tahiti, the principal member of the group. Area, 51 square miles; population, about 1,500. It consists of deep valleys and abrupt hills—the former well cultivated, and the latter heavily timbered. Here Christianity was first introduced in Polynesia; and here the South Sea College of the London Missionary Society was established. Most of the natives are Protestants.

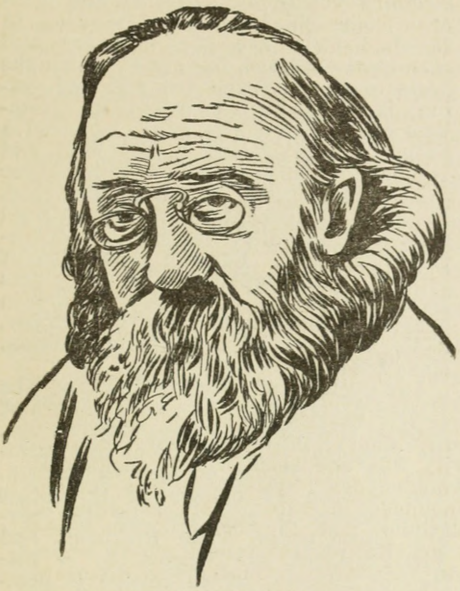
EINBECK (in'-), or **EIMBECK**, a town of Hanover; situated on the Ilme, 23 miles N. of Göttingen by rail. Though a place of considerable importance in the 15th century, and a Hanse city, it has decayed greatly in recent times.

EINSIEDELN (īn'zē-deln), a town of Switzerland, in the canton of Schwyz, 27 miles S. E. of Zurich by rail. In Einsiedeln great numbers of prayer-books, sacred images, wax candles, rosaries, medallions, etc., are made. The town is, however, chiefly celebrated for its Benedictine abbey, to which some 200,000 pilgrims resort annually to worship at the shrine of a black image of the Virgin, Sept. 14 being the principal day in the year. The abbey itself was founded in the 10th century, and after being repeatedly destroyed by fire, was rebuilt as a quadrangle in the Italian style in 1704-1719. It contains a valuable library with several incunabula and MSS., these last dating from the 8th to the 12th century; also a museum of natural science and natural history. Rudolph of Hapsburg elevated the abbot of Einsiedeln to the dignity of a prince of the empire in 1274. Near the town the Austrians under Jellachich were defeated by the French under Masséna on Aug. 14, 1799.

EINSTEIN, ALBERT, a Swiss physicist, born in 1875. For a time he held a chair in the Zürich Polytechnic School, and was also for some years a professor in the University of Prague. Later he held a research position in an institution affiliated with the University of Berlin. In 1914 he protested against the manifesto of the German professors. Einstein came into prominence through his theory of relativity, which grew out of his participation in the effort to explain the Michelson-Morley experiment, on the so-called ether-drift of the earth and its negative result. The principle of the theory is the conception of time as a fourth dimension. His theory of relativity was published in 1905 in a book, "Annalen der Physik." It was further expounded in 1916. This principle of relativity and the deflection of light by gravitation was considered by scientists the most revolutionary discovery in physical science since Newton. In April, 1921, Dr. Einstein visited the United States in behalf of the Zionist movement.

EISNER, KURT, a German socialist, born in 1858 in Berlin of Jewish parents. He attended the University of Marburg. From 1890 to 1895 he was contributing editor of the "Frankfurter Zeitung," during which time he wrote an article attacking Kaiser Wilhelm II, and for which he spent nine months in prison. Upon his release he became editor-in-chief of the Socialist paper "Vorwärts" in Berlin. From 1907-1910 he was connected with a Socialist paper in Nuremberg and both in that city and in Munich he waged a bitter campaign to arouse sentiment in Bavaria against the union with Prussia. Arrested in 1918 for his anti-war activities, he was released later in the same year and when the Revolution occured in November he became a leader in the radical Socialist party with the special objective of dividing the south German states from the Empire. He became Prime Minister in the new Bavarian Government, and at the Berne Conference of Socialists, held at Berne, Switzerland, he attacked the moderate German Socialists because of their refusal to acknowledge Germany's guilt in bringing about the World War of 1914. For this speech and for his uncompromising hostility to Prussia he became bitterly hated by large sections of the

German people. This hostile feeling finally resulted in his assassination on Feb. 21, 1919, while he was walking in



KURT EISNER

the streets of Munich, on his way from the foreign office to the Parliament.

EKATERINOSLAV (e-kä-te-rē-nō-släv′), a town of southern Russia, capital of a government of the same name, on the right bank of the Dnieper, 250 miles N. E. of Odessa. It was founded in 1787 by Prince Potemkin, and consists of a number of long, broad streets. Pop. about 195,000. The government, which is intersected by the Dnieper and at one point reaches the Sea of Azov, mostly consists of steppes; area 24,477 square miles; pop. about 3,150,000.

EKRON, the northernmost of the five great cities of the Philistines, on the borders of Judah and Dan. Beelzebub was its god.

ELAM, a district mentioned in Scripture, lying S. of Assyria and E. of Persia proper, apparently the same as the Susiana of Strabo. Its chief city, Susa (Shushan), early attained great importance in Mesopotamia. It appears that the primitive Semitic Elamites were overcome at an early period by a Hamitic or Cushite race from Babylon, called by the Greeks Cossæans.

ELATERIUM, a drug obtained from the fruits of the squirting cucumber, a native of the S. of Europe, common on rubbish in the villages of Greece and the Archipelago. The fruit breaks from its stalk, and violently expels its seeds with the surrounding mucus through the opening thus made. This is not due to any true contractility, but much, in fact, as ripe gooseberries burst after prolonged rainy weather. It is the thick green mucus surrounding the seeds which yields the elaterium.

Elaterium is used in medicine as a drastic hydragogue cathartic. Its active principle is a body called elaterin, $C_{20}H_{28}O_5$, which is probably the most powerful purgative known, the ordinary dose being only from $^1/_{40}$ to $^1/_{10}$ grain. Both elaterium and elaterin are officinal in the British pharmacopœia. It is an exceedingly drastic purgative, used in dropsy.

ELBA, a small island belonging to the Kingdom of Italy, in the Mediterranean Sea, off the coast of Tuscany, and with several much smaller isles, lying at the mouth of the Gulf of Piombino. The island of Elba is 18 miles from E. to W., with a width varying from 2½ to 12 miles in its widest part. The mountainous districts of the island yield quantities of superior iron, marble, loadstones, and alum, besides wines and fruits. On the first abdication of Napoleon in 1814, Elba was assigned to him as a residence and empire. Here he accordingly took up his residence, in the month of May; and on Feb. 26, 1815, he secretly left the island, and, landing in France, began that brief and final career known in history as the Hundred Days. Elba was a place of celebrity in the time of the Romans, and famed then, as now, for its yield of iron. Pop. about 25,500.

ELBE (el′be), a river of Germany, one of the largest in Europe. It rises on the S. W. slopes of the Schneekoppe or Snowcap, one of the Riesengebirge, between Bohemia and Silesia. From this point it flows nearly due S. into Bohemia for about 50 miles, when it turns to the W., and after about 40 miles takes a general N. N. W. direction till it falls into the North Sea, intersecting Saxony, a considerable portion of Prussia, and in the latter part of its course separating Holstein on its right from Hanover on the left. The length, including windings, is upward of 780 miles. The Elbe is stocked with fine fish.

ELBERTON, a city of Georgia, the county-seat of Elbert co. It is on the Seaboard Air Line and the Southern railroads. The city is the center of the cotton-growing region and contains a cotton factory, cottonseed-oil mill, fertilizer works, iron works, etc. There is a public library. Pop. (1910) 6,483; (1920) 6,475.

ELBING, a trading and manufacturing town of West Prussia; 48 miles by rail E. S. E. of Danzig; on the navigable river of the same name. The town, founded in the 13th century by colonists from Lübeck and Bremen, has a church of the 14th century. It is connected by a canal with the Dreventz, a tributary of the Vistula, and in 1877-1884 a mole was constructed in the harbor, 3,500 yards long and 5½ wide. Steamships and torpedo-boats are built here; and there are large iron and brass rolling-mills, and tinware, machine, and cigar factories. The linen industry and the export of lampreys are also of importance. Pop. about 58,000.

EL CENTRO, a city of California in Imperial co. It is on the Southern Pacific, the Holton Interurban, and the San Diego and Arizona railroads. It is the center of an important agricultural and fruit-growing region which has been greatly developed in recent years. Its industries include a cottonseed oil mill, cotton gins, warehouses, and an ice plant. It has excellent schools, hotels, churches, and four banks. Pop. (1910) 1,610; (1920) 5,464.

ELDORADO, a city of Illinois, in Saline co. It is on the Cleveland, Cincinnati, Chicago and St. Louis, the Illinois Central, and the Louisville and Nashville railroads. In the neighborhood are important coal mines. Its industries include machine shops, flour mills, lumber yards, etc. Pop. (1910) 3,366; (1920) 5,004.

ELDORADO, a city of Kansas, the county-seat of Butler co. It is on the Missouri Pacific, the Atchison, Topeka, and Santa Fé, and the Kansas City, Mexico, and Orient railroads. Its industries include machine shops, carriage works, flour-mills, and limestone quarries. It has an extensive trade in agricultural products and live stock. There is a public library. Pop. (1910) 3,129; (1920) 10,995.

ELEAZAR (help of God), the third son of Aaron, and high priest after him (Ex. vi : 23; Num. xx : 25-28). The high priesthood continued in his family through seven generations, till the time of Eli, when we find it transferred to the line of Ithamar. In the reigns of Saul and David it was restored to the line of Eleazar, and so continued till after the captivity.

ELECTION, in politics, the selection by voting of a person or persons to occupy some post or office. The most important elections are those of the members of the supreme legislative assemblies of the different countries, and as to the manner in which these are carried out strict laws are in force. In such elections voting by ballot is now general. The chief forms of election in Great Britain are parliamentary and municipal elections, in both of which the basis of the suffrage (or right of voting) is the payment of poor-rates. Members of Parliament formerly required a property qualification in England and Ireland; but this restriction, which never existed in Scotland, has been abolished. In both parliamentary and municipal elections the ballot has been in operation since 1872. For the prevention of bribery and corrupt practices many acts have been passed, of which that now in operation came into force in October, 1883, and has been annually renewed since 1884.

Jurisdiction of election laws of the United States extends to such officers of Federal Government as are elective, viz., the President, Vice-President and members of the House of Representatives. The election of officers of the State governments is regulated by the several State codes. The President and Vice-President are elected by a college of electors, which college is composed of as many electors as there are Senators and Representatives in Congress at the time of the election of such electors. The people vote directly for these electors. Members of Congress are elected as follows: Each State is entitled to two Senators in Congress, who are elected by the Legislatures of the several States; members of the House of Representatives are elected directly by the people. In general, it may be said that all citizens of the United States are entitled to vote except those residing in the District of Columbia. In 1870 persons of African descent were given the right to participate in elections.

The several States have enacted laws for the regulation and management of their local elections, embracing the choice of the officers of the State, city and county. The constitutions of the several States secure to citizens the right of suffrage. The laws of each State provide the means of effecting the ends of the constitution, and prescribe the qualifications of voters, which vary somewhat in the different States. In all the States the following qualifications may be classed as universal: That the elector shall be over 21 years of age, neither a lunatic nor a pauper, and prepared to take, if necessary, an oath of allegiance to the Federal Government. The length of residence in the State previous to an election is fixed by the State law and varies in the different States. Some

States require either property qualification or ability to read and write.

ELECTIVE COURSES. Those subjects in the colleges and preparatory schools which a student chooses to take, but which are not required for the completion of his school or college course. Prior to 1880 the number of electives in the standard colleges of the United States was small, the students' course consisting of one largely mapped out for him by the college authorities. The only exceptions to this were found in the Western colleges and State universities which allowed a wide latitude of choice to the student. Yale, Harvard, Princeton, Columbia, and the University of Pennsylvania all required Greek, Latin, and higher mathematics for the Bachelor of Arts degree. In a few of the Eastern colleges a course leading to the degree of Bachelor of Science was offered, but for the Arts degree, the above work was required for at least the first two years of college work. Greek was the first to be taken from the required list, and by 1920 the study of that language was no longer obligatory for those aiming for the Bachelor of Arts degree. Mathematics is required only as far as plane and solid geometry and plane trigonometry. Latin still is required for the Arts degree, but not anything like the amount of time needs to be spent upon it in college as formerly. In fact, in all but one or two colleges a four years' course in the preparatory school Latin will enable the student to be a candidate for the Arts degree. This dropping of required subjects automatically increased the number of elective ones so that in 1920 the college student has virtually a free field. This situation, of course, is not duplicated in the technical schools where the work must of necessity be prescribed. The latitude of choice given students in the Arts course varies with the different universities. At Harvard, after the student has entered, his course is entirely elective. At Princeton there still remain a few subjects which are required. Quite a few of the universities have adopted the "group system," that is, allowing the students to choose among groups of related subjects. The fears expressed by many of the conservative schoolmen that with the elective system the students would choose all the easy courses and avoid the difficult ones has caused "advisors" from among the faculty to be appointed, without whose consent his roster is not complete. Because of the "groups" and the faculty "advisors" this evil has not been a serious one, or at least is not so regarded by most schoolmen.

The increase of elective courses in college and the variety of degrees offered by the universities led to an increase in elective students in the secondary schools. Those students who showed a disposition to prefer scientific studies to the ancient languages were allowed to drop the latter. As we have seen, such students can always secure the Bachelor of Science degree, and not a few can obtain the Arts degree upon the completion of their college course. This elective, then, is offered by nearly all the high schools and private academies, with the exception of the New England private schools where the ancient languages still retain their traditional place. By reason of the fact that the colleges as yet prescribe closely the work which is necessary for entrance, the secondary schools have not been able to increase the number of their elective studies. The public high schools are now doing so more and more, but that is largely because less than one-third of their students ever enter college.

ELECTORAL COLLEGE, in the United States, the body of men elected in each State to cast the vote of the people of the State for presidential candidates. The State conventions of the various parties nominate the electors, one for each Representative, and one for each Senator in Congress. These persons are voted for on the general election day. The 12th amendment to the Federal Constitution orders the electors to meet in their respective States and vote by ballot for President and Vice-President separately. They are to make distinct lists of all persons voted for by themselves for the two offices, and send those lists, sealed, to the president of the Senate at Washington. Sections 131 to 151 of the Federal Revised Statutes prescribe generally the proceedings of the electors. They are to meet on the last Wednesday in December in the year in which they are elected, in such place as the Legislature of each State may direct. The governor is to give them three certified lists of those chosen to be electors; the electors are to make three lists of the persons balloted for by them for the presidency and vice-presidency, and to the certified lists annex the certificates furnished by the governor. They are to appoint one of their number to carry one of the certificates to the president of the Senate before the first Wednesday in January, and to send to the president of the Senate, by mail, another copy of the certificates; and the third they are to give to the judge of the district wherein they assemble.

ELECTORAL REFORM, the measures taken in the United States to safeguard

elections from corrupt and illegal practices have become much more stringent in the opening years of the 20th century. Generally speaking, this was a reform era in the States in matters social and political. Massachusetts in 1892 passed a law requiring all political campaign committees to file a written statement, duly sworn to, of all expenditures made by them. The object of such a law was to secure publicity and no limit was placed on the amount that could be spent. In the succeeding years nearly every State enacted such statutes compelling publicity of campaign expenditures. As yet no State has limited the amount spent. Mr. Bryan and other reformers have demanded that these statements be filed and made public before election day, but the suggestion has nowhere been adopted.

The reform of the civil service by taking away from candidates their power, when elected, to reward party workers has decreased the amount of illegal and corrupt practices by taking away an incentive to such actions. Many States, such as Pennsylvania, have passed personal registration laws for the larger cities requiring citizens to register their names on books kept by election officers a month before the election occurs. The object is to allow the lists to be purged of voters who have no residence in the district and to prevent a sudden influx of paid voters. Elections in the city of Philadelphia were much more honestly conducted following the passage of this law. The change of election days in the various States so as to make the presidential elections all take place on the same date has decreased bribery in such elections. The tendency formerly was to center attention on those States voting prior to November and to attempt to carry them regardless of cost. The adoption of the Australian secret ballot has led to a decrease in bribery and intimidation of voters.

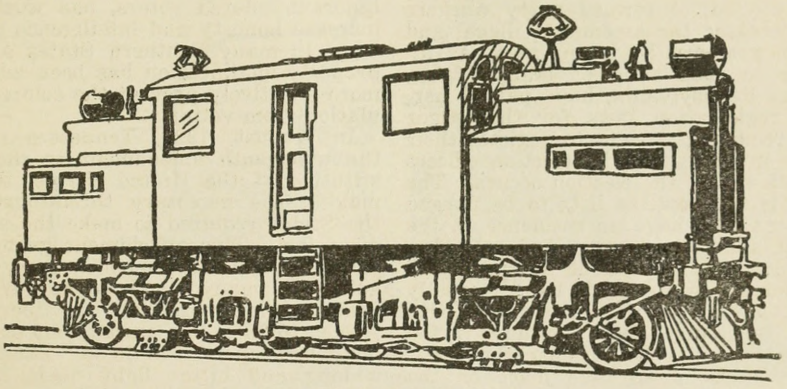
There has been an effort on the part of reformers to discourage party voting and to encourage so-called independent voting. Owing to the control of the legislatures by either of the two well-established parties efforts to legislate on this reform have not been uniformly successful. The tendency to vote a straight party ticket has always been strong because of the ease with which it can be done: a simple mark at the head of the ticket being all the voter is required to do. As there are often two hundred names on a ballot if the voter undertakes to "split" his ticket he runs considerable risk of losing his vote entirely by making some trifling mistake in the marking of it. Reformers have suggested two ways of coping with the situation. One of them, adopted in Massachusetts, provides for the entering of the names on the ballot in alphabetical order without any party label and allowing no way by which the voter by a single cross can vote for more than one candidate. This is called the "blanket" ballot. The other, adopted in New Jersey and in other States, is the "short ballot." The number of elective offices is greatly reduced, lessening the names appearing on the ballot, and consequently increasing the importance and prominence of those that do. In the Southern States the colored voter after 1876 was kept away from the poles by intimidation or by the "grandfather" clauses inserted in the State constitution. When these latter were declared unconstitutional by the United States Supreme Court, educational qualifications were substituted. This method, while administered so as to exclude only ignorant colored voters, has worked to increase honesty and intelligence in voting. In many Southern States a small property qualification has been added to more effectively prevent the colored population from voting.

In August, 1920, Tennessee ratified the nineteenth amendment to the Constitution of the United States, thereby making the necessary three-fourths of the States required to make the amendment law. This amendment grants full suffrage rights to women in every State, and while many Northern and Western States prior to 1920 had permitted women to vote, this amendment makes it obligatory upon all to do so. Thus ended a long and bitter fight made by the women for enfranchisement.

The main interest of election reformers in the United States is now directed to the primary elections. As these are wholly within the party, and the political party itself is not provided for in the State and Federal Constitutions, the task of reforming it is rather a difficult one. The right to nominate is such an important one that if corrupt interests or the political "boss" control the choice of candidates the matter of the elections becomes chiefly a choosing between two sets of "bossed" nominees. Most of the States had by 1920 provided for the naming of the candidates by direct primary vote instead of the old convention system, believing that it would be more difficult for the "boss" to manipulate the votes of thousands than it was for him to sway a convention. This has proved only partially true. In the presidential primary campaign of 1912 many Northern States had what was known as presidential preference primaries in which the voters of the party instructed their dele-

gates to the national convention. In most States, however, it is not obligatory upon the delegates to follow these instructions. In the primary elections there is no law compelling publicity of campaign expenditures, and this again has tended to produce corrupt practices in party elections. The revelations made by the Congressional Investigating Committee as to the money spent by the rival candidates for the Republican nomination in 1920 stimulated the demand for stricter State laws governing primary elections.

In England there have been but few amendments to the excellent Corrupt Practices Act of 1883, which limits the expenses of candidates and clearly excludes all methods of intimidation, bribery, or any other means of improperly influencing the voter's choice. By Act of Parliament woman suffrage was granted in 1918, and in the elections held in December of that year women cast their votes for Members of the House of Commons.



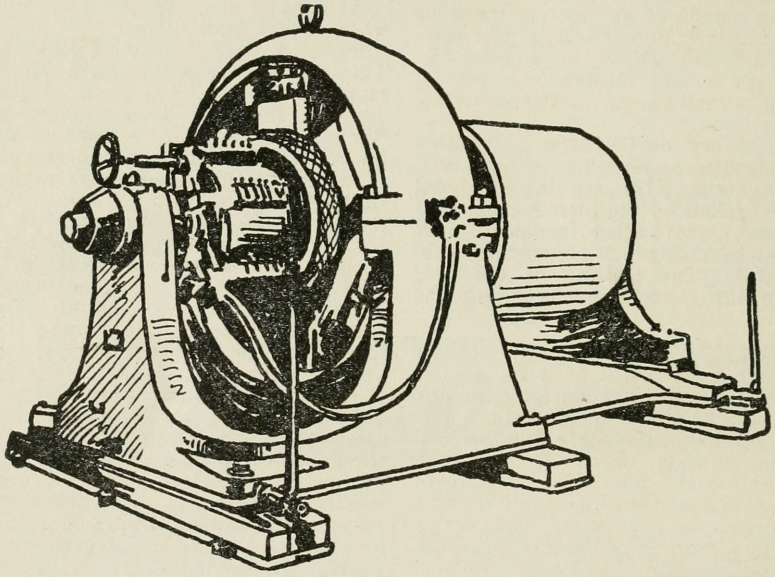
ELECTRIC ENGINE

ELECTRICAL MACHINE, a machine for converting mechanical work, either by friction or by induction, into electric energy. The earliest known form was constructed about the middle of the 17th century by Otto von Guericke. It consisted of a ball of sulphur mounted on an axle which was rotated as rapidly as possible while the hand of the operator was pressed against the ball. The friction of the hand upon the sulphur generated electricity. Sir Isaac Newton replaced the sulphur ball with a glass globe, and later workers substituted woolen cloth or pieces of leather for the hand. In 1768, Jesse Ramsden constructed the first plate electrical machine, consisting of a glass disc, which was rotated rapidly between two leather rubbers. The glass became positively charged and the charge was collected by means of insulated metallic forks, while the negative electricity produced on the leather escaped to the ground. A modification of this machine was that of Edward Nairne, who used a glass cylinder, with insulated conductors on opposite sides. One conductor carried a leather cushion, and the other a row of metal points, while a silk apron covered the surface of the cylinder from the leather almost to the points. Positive electricity was formed on the conductor carrying the points and negative electricity on that carrying the leather cushion, while the silk served to prevent the loss of the electric charge while the cylinder was passing from the rubber to the collecting points. All these types of frictional machines have been rendered obsolete, however, by the introduction of the so-called "influence machines," which operate by induction. Suppose a conducting body is brought near to an electrified substance having a positive charge. Then negative electricity is attracted by the charged body, while positive electricity is repelled, and if the conductor be connected with the earth, the positive electricity will escape, leaving the conductor charged with negative electricity. This is the underlying principle of the influence machine. In the Topler machine, for instance, two glass discs are used, one of which is fixed, while the other will revolve. On the latter are fixed a number of strips of tinfoil and, on the other, two so-called "field-plates," also made of tin-foil. A charge is given to one of the field plates, and then the movable plate is revolved. Let us suppose that the charge on the field plate is positive. Then as a tin-foil strip moves into place opposite the field plate, negative electricity is attracted and positive electricity repelled. A brass wire brush makes con-

tact with the metallic strip and the positive electricity escapes, leaving the strip charged with negative electricity. Another strip moves into place, and the same process is repeated. In the meantime, the first strip has moved on toward metal collecting combs, and communicates its charge to them. The electricity from combs passes to Leyden jars, where it is stored.

The more modern Wimshurst machine resembles the Topler, but consists of two glass plates, each fitted with tin-foil discs, and each made to revolve in the opposite direction to the other.

ELECTRICAL UNIT. A coulomb. The quantity of electricity that liberates .000162 grain of hydrogen from water.



ELECTRIC DYNAMO
Direct current, lighting and power generator.

ELECTRIC BATTERY. See STORAGE BATTERY.

ELECTRIC DENSITY, or ELECTRIC THICKNESS, the quantity of electricity found on a given surface.

ELECTRIC FURNACE. Electric furnaces may be broadly classified into (1) *Resistance furnaces*, in which heat is produced by the passage of an electric current through a poor conductor, (2) *Arc furnaces*, in which the heat of the electric arc is used, (3) *Induction furnaces*, which are a modified form of the resistance furnace, and in which the heat is generated by an induced current. In this type of furnace the resistance element is frequently formed by the furnace charge, which also acts as the secondary of a transformer; current at high voltage and low amperage is supplied to the primary, thus inducing high amperage at low voltage in the secondary.

Electric furnaces can only compete, economically, with the ordinary direct-fired furnace where electric power is generated cheaply by water-power, as, for instance, at Niagara. They also have the advantage that much higher temperatures can be produced in them, the maximum temperature obtainable in non-electric furnaces being about 2,000° C, whereas, in electric furnaces, a temperature of 3,500° C is easily maintained. There are some processes in which these extremely high temperatures are necessary, as, for instance, in the manufacture of carborundum. In this process, a core of granular carbon, or coke, is placed between electrodes, and around the core is packed a mixture of coke and sand. The electric current flows through the core and raises the temperature of the sand and coke mixture to such a point that combination takes place with the formation of carborundum.

The induction type of furnace is largely used in the steel industry, one of the best known examples being that designed by F. A. Kjellin. In this furnace, current at 3,000 volts is supplied to the primary, inducing a current of

30,000 amperes in the metallic charge, which forms the secondary.

Electric furnaces are also used in the manufacture of aluminum, calcium carbide, phosphorus, various iron alloys, and in the production of artificial graphite.

In the laboratory, small electric furnaces are in common use. In these a current is passed through a high resistance wire, made of nichrome or some similar alloy, which is wound around the furnace, the latter being made of fire clay. The whole is inclosed in insulating material to prevent loss of heat by radiation.

ELECTRIC FUSE. (1) A device used in blasting to explode the charge. The fulminate or the charge itself is lighted by means of an electric spark or a resistance section of fine platinum wire, which is heated to redness by the passage of an electric current induced by a voltaic or magneto-electric battery.

(2) A safety device used to protect electric circuits against too great a volume of current. The regular or metal circuit is broken by the introduction of a wire of lead or soft alloy, formed to melt at a point beyond which a current would be harmful. The melting of the fuse will stop the current by breaking the circuit.

ELECTRIC HEATER. In electric heaters a coil of metal of more or less resistance is wound around a frame and is made the channel of a current surrounded by insulating material, the heat closed in various forms of receptacle which radiate it. The wire or strip of metal may be surrounded by air or by a non-inflammable substance that serves as a conductor. Porcelain, asbestos, enamel, or glass into which the coils or circuits are imbedded are largely in use for fireproof insulation, while some classes of heaters are imbedded in materials such as hyposulphite of sodium and crystallized acetate of sodium. There are great varieties in the methods used. In the Parville system heat is engendered by means of rods of metallic powder mixed with fusible clay, compressed by a force of 2,000 kilograms per square centimeter and baked at a temperature of 1,350° C. The Prometheus heater has a strip of selected metal fused to an enamel covering which receives the heat sent through the strip of metal. In certain types a metallic paint is fired upon mica strips, which are so grouped as to determine the size of the heater. Electric cars are usually heated by sets of conducting wires coiled round porcelain tubes and connected with the motor. Electric heaters are somewhat too costly for house-heating, but they are of great use in appliances such as flatirons, cooking utensils, and small radiators. The industries devoted to the production of small heaters of this class have grown steadily in recent years. The larger kind are taking their place in certain processes of manufacture and production as in oil fields, where electric heaters are used to stimulate the heavy petroleum and cause it to flow more easily.

ELECTRICITY, a powerful physical agent which makes its resistance manifest by attractions and repulsions, by producing light and heat, commotions, chemical decompositions and other phenomena.

About 600 B. C. Thales dicovered that when amber was rubbed with silk it became capable of attracting light bodies. The ancients seem to have known no more than this regarding electricity; nor for the first 16 centuries of the Christian era was much addition made to the solitary known fact in electricity.

In 1600, Gilbert, who was surgeon to Queen Elizabeth and to James I., published a book, "De Magnete," in which for the first time the word "electric" was used in connection with science. He died in 1603. He regarded magnetism and electricity as two emanations of one fundamental force. He showed that not merely amber, but sulphur, glass, etc., are electrics. Otto Guericke, of Magdeburg, discovered that there was a repulsive as well as an attractive force in electricity, and about 1647 constructed the first electrical machine.

Newton, in 1675, observed signs of electrical excitement in a rubbed plate of glass. Hawkesbee, who wrote in 1709, also observed similar phenomena; and Dufay, in the "Memoirs of the French Academy," between 1733 and 1737, generalized so far as to lay down the principle that electrified bodies attract all those which are not so, and repel them as soon as they have become electric by the vicinity or contact of the electric body.

Dufay also discovered that a body electrified by contact with a resinous substance repelled another electrified in a similar way, and attracted one which had been electrified by contact with glass.

He thence concluded that the electricity derived from those two sources was of different kinds, and applied the names vitreous and resinous to them. Franklin attributed this difference to an excess or deficiency of the electric fluid, the former condition existing in electrified glass and the latter in resins.

Otto Guericke had discovered that his sulphur globe, when rubbed in a dark

place, emitted faint flashes of light, and shortly afterward it was noticed that a similar phenomenon occurred at the surface of the mercury when the barometer was shaken—a fact which one of the celebrated mathematicians, Bernouilli, attempted to explain on the Cartesian system, but which was afterward correctly attributed by Hawkesbee to electric charges. Wall, in 1708, observed the sparks produced from amber, and Hawkesbee noticed the sparks and "snapping" under various modifications.

Dufay and Abbé Nollet were the first to draw sparks from the human body, an experiment which attracted great attention, and became a species of fashionable diversion at the time.

The discovery of the Leyden jar is attributed to Cunæus of Leyden, in 1746, who, while handling a vessel containing water in communication with an electrical machine, was surprised at receiving a severe shock. A similar event had happened the year previous to Von Kleinst, a German prelate.

In the 18th century the names of the principal contributors to the advancement of electrical science are Newton, Hawkesbee, Dufay, Guericke, Cunæus of Leyden (to whom we owe the Leyden jar), and Franklin, who, 1747, pointed out the circumstances on which the action of the Leyden jar depends. Monnier the younger discovered that the electricity which bodies can receive depends on their surface rather than their mass, and Franklin soon found that "the whole force of the bottle and power of giving a shock is in the glass itself"; he further, in 1750, suggested that electricity and lightning were identical in their nature, and in 1752 demonstrated this fact by means of his kite and key. About the same time D'Alibard and others in France erected a pointed rod 40 feet high at Marli, for the purpose of verifying Franklin's theory, which was found to give sparks on the passage of a thunder cloud. Similar experiments were repeated throughout Europe, and in 1753 Richman was instantly killed at St. Petersburg by a discharge from a rod of this kind.

The more important discoveries since those days relate rather to electricity produced by voltaic or magnetic action.

In the later history of electricity no name is greater than that of Michael Faraday, who was born in London in 1794, was appointed by Sir Humphry Davy assistant in the laboratory of the Royal Institution in March, 1813, and in 1831 commenced the publication of a series of splendid discoveries in electricity.

The past history of electricity centers round the frictional machine and the voltaic battery. The first-named is now only of experimental interest, and the second, if we except its use in signaling (telegraphy and telephony), is quickly being supplanted by the more economical and vastly more powerful dynamo-machine. To this contrivance, in its various forms, as designed by different makers, and in less degree to the secondary battery (now quite in its infancy), electricians look for the advancement of their science. The fact that the Gramme and similar machines are reversible is considered to be one of the most important discoveries of the century. By reversible is meant its power to act as a motor when coupled up with a distant machine, under which circumstances its armature rapidly revolves in the reverse direction to what it would do if used directly—as in the production of the electric light. By such means the electrical transmission of power from place to place has become possible.

Important advances in the knowledge of the connection between electricity and matter have in recent years been made through the observation of the ionization of gases. The principal researches along this line were made by Professor J. J. Thomson, at the Cavendish Laboratory, at Cambridge, England.

All gases can be made conductors of electricity when the molecules of the gas have been broken into parts, that is, ionized. Among the methods for ionizing gas are (1) application of high temperature; (2) the passage of a spark in the neighborhood; (3) exposure to Röntgen rays or to rays from a radioactive substance such as uranium; (4) exposure to "cathod" rays; (5) exposure to "ultra-violet" light. It has been established that the negative ions of all gases, however they may be produced, are identical.

The practical application of electricity to industry and to domestic uses has been one of the great developments of the last generation. The development of the automobile has called for storage batteries of high power and electricity and has also been employed as a motor power for motor vehicles. See MOTOR VEHICLE. In transportation, the use of electricity has come to be common, especially in suburban lines of railroad where a long haul is not required. For domestic use electricity is employed not only for lighting and heating but for devices including vacuum cleaners, electric irons, washing machines, and countless other devices.

For a discussion of the different phases of electricity and its use, see STORAGE BATTERIES, ELECTRICAL MACHINE, TRANSMISSION OF ELECTRIC POWER, DYNAMO,

ELECTRIC HEATER, ELECTRIC RAILWAYS, etc.

ELECTRICITY, ANIMAL, the branch of electric science to which an experiment by Galvani gave birth. His wife, who was making soup from frogs, happened to put them, after being skinned, in proximity to a charged electrical machine belonging to her husband. On touching them with a scalpel their legs became greatly convulsed. Galvani on his return was told what had occurred, and repeated the experiment on several occasions. He united the lumbar nerves of a dead frog with its crural muscles by a metallic circuit. He came to the erroneous conclusion that animal electricity existed in the nerves and muscles of frogs, etc. In this explanation Galvani ignored the metallic connecting wire. His contemporary, Volta, gave attention to this, and found that the contraction of the limbs is more energetic when the connecting arc is made of two metals instead of one. He therefore inferred that the metals took the active part in producing the contraction, and the disengagement of electricity was due to their contact, and that the animal parts constituted only a conductor, and at the same time a very sensitive electroscope. In 1793 he published these views, and in 1800 first described and constructed what has since been called after him the voltaic pile. Febroni observing that the disks of zinc in the pile became oxidized in contact with the acidulated water, considered, as did Wollaston and Davy, that the oxidation was the chief cause why electricity was disengaged. Now voltaic piles have nearly given place to voltaic or galvanic batteries of which there are many varieties.

ELECTRICITY IN MEDICINE. The use of electricity in treatment of human diseases dates back to the 18th century, when the electric spark and frictional electricity were so applied. Franklin was the first to use shocks from Leyden jars for the treatment of paralysis. As far back as 1775 the effect of static electricity on the human system was well known, and was dealt with to considerable length in the writings of Tiberius Cavallo in 1777. The discovery of voltaic, or galvanic, electricity in 1800, and of faradic electricity during the past century were further steps in electro-therapeutics, since they allowed of a gentler treatment than was possible by means of the Leyden jars. For a long time static electricity was not in use, but more recently there has been a return to that method because of modern methods of application.

The application of electricity to the human body for curative purposes may be divided into three forms; static, galvanic, and faradic. The first form is produced from the ordinary frictional machine, in which glass plates are revolved against chamois, rubber or horsehair brushes, the current being received in Leyden jars. Galvanic electricity is set in motion by the voltaic battery. And faradism, or faradic electricity, is produced by induced, or interrupted, currents, generated by magneto-electric or electro-magnetic induction coil machines.

The first form, static electricity, produces many effects on the human body. It has been long known that the body loses weight through its application, and that it causes the temperature either to rise or fall, due to increased functional activity. It sets free the potential energy cells, causes contraction of protoplasm, excites nerve fibers, nerve cells and nerve centers, and stimulates nutrition. It is, therefore, effective in the treatment of lumbago, spastic paralysis, locomotor ataxia, chronic and muscular rheumatism, neuritis, progressive muscular atrophy, insomnia, congestion of the liver, and sciatica. It also serves to control nervous headaches, hysteria, neurasthenia, and is valuable also as a general tonic. It has also been effectively used in reducing sprains. The only danger of its use, in unpracticed hands, lies in the liability of a reduction of the blood pressure, which in certain cases may produce bad effects. For this reason care should be taken to avoid the numerous quacks and charlatans who advertise widely the use of electricity for curative purposes. For this reason it is advocated that the use of electricity be restricted to the legitimate medical profession.

Galvanic treatment is produced by passing a voltaic current from a battery of many elements through the living body, which causes a shock, or contraction, of the muscular system, succeeded with a distinct interval by a momentary sensation or flow of heat due to the electric current. During the continued passage of the current, slight tingling sensations and a raising of the temperature are felt, especially in those parts in contact with the electrodes, which become painful and congested. On opening the circuit, the depolarization of the tissues which follows is accompanied by a second shock and a glow of heat, which are powerful in proportion to the length of time the circuit has been closed. The contraction of the muscles is in proportion to the intensity, rather than to the amount of the electricity which flows through the body. The use of this

method of application is to exercise atrophied muscles and secure their nutrition. In surgery the electrolytic action of the galvanic current destroys tumors and abnormal growths in the nasal cavity. The galvanic current is also used in heating a cautery for searing a surface to secure a cicatrix.

The use of faradic electricity is usually for its tonic effect. The continued passage of the interrupted currents acts chiefly as a mechanical stimulant, first exciting, and after a time depressing the vitality of the parts in the circuit. Vibrations produced by purely mechanical means, without the use of electricity, may be made to cause very similar effects. Faradization is especially applicable to those diseases in which a deficiency of functional energy is involved, as in mild cases of spinal and peripheral paralysis. Changes of circulation or of the molecular state may be excited in the central organs by reflex irritation. It has also been used with good effect in the treatment of gout, rheumatism, widespread ecezma, and constipation, when due to indigestion.

Galvanic electricity, however, will also produce all the effects due to the faradic current, but to a very much higher degree.

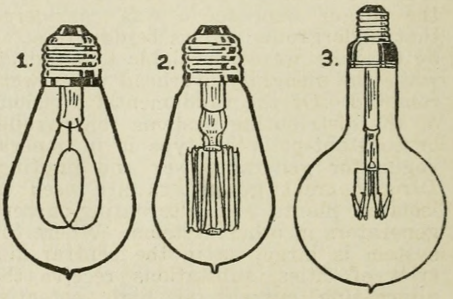
ELECTRIC LAMP. See ELECTRIC LIGHT.

ELECTRIC LIGHT, a brilliant light emitted by the white-hot points of two pieces of carbon when used as the electrodes of a powerful voltaic battery, or other generator of electric currents; also the light emitted by the incandescence of a metallic wire, or carbon filament, when subjected to the passage of an electric current.

In 1809 Sir Humphry Davy, while experimenting with a powerful battery, discovered the phenomenon of the voltaic arc. He used as electrodes points of charcoal. Foucault and later experimenters replaced these by pencils of gas-retort carbon, and this material is yet used in some forms of regulators. A better result, however, is obtained from manufactured carbon pencils, and this manufacture already represents a distinct trade both here and in Europe. Coke, lampblack, cane sugar, etc., are the ingredients used for these pencils, which are subsequently placed in molds and submitted to a red heat.

The discovery by Faraday (1830) that an electric current could be induced in a coil of wire by the approach to it or recession from it of a magnet may be said to have given electricians the first hope of giving the electric light a commercial importance. The magneto-electric machines which followed upon Faraday's discovery were soon many in number, each one exhibiting some improvement upon its predecessor. Of these pioneer machines may be mentioned that of Siemens, who in 1854 introduced a new form of armature or coil, which superseded the bobbins formerly used; Wilde, of Manchester, who produced a powerful machine in which the electromagnet was first employed in this connection, it being excited by a permanent or ordinary horseshoe magnet.

In England the Gramme machine was first used in 1874, to provide a light for the summit of the Westminster clock tower. Since that date it has been greatly improved. The Gramme machine gives a continuous current like that afforded by a voltaic battery. An electric current sent through a bridge of vapor or arc between electrode conductors produces the arc light. A variation is the incandescent lamp in which a wire of carbon or metal of more or less resistance is mounted in an exhausted glass bulb. The reaction of the filament to the current generates a heat which glows into vivid incandescence. Dynamos moved by water power, gas or steam, generate the electric current at a central station or plant of more or less dimensions according to the volume of current in requisition. The organization of high-voltage power has made it possible to distribute electric current over an ever-widening radius. In cities in the United States the stations of the electric lighting systems have been shown to be capable of development to the extent of transmitting current over whatever area required, but the clearest demonstration is made by the power stations at Niagara, from which center current is transmitted to cities in some cases almost 200 miles distant. There is perhaps no larger electric-lighting system in any country than that owned in Chi-



ELECTRIC LIGHT—TYPES OF ELECTRIC BULBS

1. Carbon Lamp 2. Mazda Lamp 3. New Mazda

cago by the Commonwealth Edison Co., in which current is distributed by four stations with a total capacity of 320,000 kilowatts, one single generating unit being of 35,000 kilowatts. Both aluminium and copper filaments are largely used in these systems of distribution, but copper being superior in conductivity is the wire most in use. Aluminium, owing to its lightness, is found especially valuable in long-distance work, and the two metals, differing in density and consequently in bulk, have to be employed variously, having regard to the requirements. When electric lighting first became general, overhead installation was the method most in vogue as being the easier and less expensive, and the more easily manageable for repairing purposes. It was recognized, however, that the æsthetic results were not quite desirable and as the system developed the underground cable was introduced in the larger cities. Despite the larger expense it was considered that underground cables being protected by conduits were less liable to accident, while the unsightly overhead wires were removed. Of the fundamental divisions of the distributing systems the parallel or constant-potential type is in general vogue for general power and lighting. Direct-current generators are used in isolated plants and alternating-current generators in other systems. Where the system is large, as in the central district of cities, substations receive the alternating current at high potential and convert it by dynamo machines to direct current, which is distributed by a three-wire system. The alternative to the parallel system is the series, constant current, system in which the current is sent from a dynamo through each lamp successively returning to the dynamo without subdivision. Regulators keep the current constant, the voltage being differentiated according to the number of lamps. Carbon, flame carbon, metallic oxide and mercury arc lamps may be used or incandescent lamps using filaments of carbon, metallized carbon, tantalum or tungsten. In the arc lamps are the two electrodes with regulators establishing the arc and feeding the electrodes as they burn, the connection being maintained with an external circuit. There are various divisions among arc lamps, such as the parallel and series type, and open and inclosed arcs. In carbon arcs cylindrical electrodes are used prepared from gas coke or petroleum coke. The metallic oxide arc is provided with a positive electrode of copper, while the mercury arc can be produced only in exhausted tubes of glass or quartz. In incandescent lamps the tungsten metal filament has been found very efficient. Its denseness having been overcome, its high melting point rendered it possible to heat it without too speedy evaporation. It has a conductivity much superior to carbon, which is apt to evaporate much below its boiling point. The nitrogen-filled tungsten lamp has been highly developed for the lighting of thoroughfares. The average incandescent lamp is exhausted by methods of air pumping supplemented by the consumption in each chamber of phosporus compound. The lamp invented by Dr. Nernst of Göttingen University had considerable vogue before the advent of the tungsten lamp. Rods of earth oxide, such as yttria and zirconia, were used as illuminating elements, but as these materials were lacking in conductivity when cold they had to be supplemented with an external heating apparatus. As success was attained in the use of luminous elements, methods had to be found to temper the glare. As a result opportunities for the use of variously formed and colored lamps and glass coverings has led to considerable artistic development. The concealment of the lamps by various devices and the projection of the direct lighting onto white ceilings are methods that have come largely into vogue with a resultant diffusion of light resembling daylight.

ELECTRIC RAILWAYS, cars driven along tracks by electric power, supplied either from a central power station, or storage batteries, the latter method being no longer in practical use. The first experiment made in an electrically driven vehicle, interesting from a historical point of view rather than from any practical results it attained, was undertaken by Thomas Davenport, of Brandon, Vermont, a blacksmith with a self-developed education in electricity and mechanics. In 1835 he attempted to propel a wagon by means of a revolving electro-magnet, without any degree of success. A more significant attempt was made three years later, in 1838, by Robert Davidson, in Aberdeen, Scotland, who built a small locomotive which was able to move along a track for a considerable distance. In 1850 the first practical electrical locomotive was built in this country, by Prof. C. I. Page, of Washington, D. C. This electrically driven vehicle, of sixteen horse power, was tested on the tracks of the Baltimore and Ohio railroad, and attained a speed on a level stretch of track of nineteen miles an hour. In both these mechanically successful cases, however, the commercial value of the experiment was

handicapped by the limitations of the storage battery, which was too expensive as a means of locomotive power. It was not till the dynamo was invented and developed that the electric railway attained its first possibility.

It was the development of the dynamo which made it possible to generate the electric power necessary for propelling the cars at a central point and transmit it to the moving cars by means of overhead wires or third-rail tracks. It was on this principle that the first practical electric railway was built, in 1879, at the International Exposition held in Berlin, by Siemens and Halske. The demonstration was made by means of a locomotive running on a track a thousand feet in length. In the following year Thomas A. Edison and Stephen D. Field, in this country, began experimentation. In 1883 they exhibited an electric locomotive in Chicago, which was the first of the type which is now successfully employed all over the country. So convincing was the demonstration that in the following year the first track was laid on a city street for practical electrical railway operation, in Kansas City, Mo., and there accommodated public traffic. This venture was so eminently successful, from a commercial point of view, that several other cities followed the example of Kansas City with electric railway service. Four years later, in 1888, Richmond, Va., electrified its whole urban street railway system, with a total of thirteen miles of track. Before the close of the year there were thirteen electric railway systems in operation in as many municipalities in the United States and Canada, with a total length of track of forty-eight miles.

From now on the development of electric railway construction went on at a rapid pace, existing municipal services being not only converted to electric power, but new tracks being laid and extended far into the country districts. The electric railway, or trolley car, as it is more popularly called, has not only displaced the old urban horse cars and cable cars, but it has widely supplemented the regular steam railroads. It has been one of the powerful influences in bringing the rural population into close touch with city life, in that it has made transportation from the rural communities into the larger towns and cities easy and cheap. In this respect it stands perhaps equal with the automobile. In passenger traffic the electric railway has been a keen competitor of the regular railroads, especially in the more populous rural districts.

Finally the steam railroads were themselves affected and subjected gradually to the transformation from steam to electricity. In the urban districts many railroads now employ electric locomotives. Most notable example is New York City, into which no passenger train is now drawn by steam locomotives, all the lines entering the metropolis being now equipped with electric motive power. Most notable illustration of the development in this direction has been the electrification of five hundred miles of track of the Chicago, Milwaukee and St. Paul system, where it crosses the continental divide through Idaho and Montana, which took place in 1916. In 1919 over two hundred miles of track were added to the same system, through the Cascade Mountains in Washington. Along these stretches of line locomotives 112 feet long, some of 2,000 horse power, haul long trains of passenger and freight cars up and down the steep grades of the mountains. Coasting the down grade, the revolving wheels generate enough supplementary electric power to contribute over 40 per cent. of the power needed for the upgrade hauls. The power, transmitted from the power stations to the locomotives by wires or third rails, is generated from water power, of which a great deal may be found in the mountain districts. It is this which renders electricity as motive power much cheaper than steam. Where water power is not available coal is needed to generate the current. Even under these circumstances the operation of railroads by electric power is cheaper than steam, but the necessity of building power plants and the interest absorbed by the capital invested in them makes the total cost more. Where railroads are public property, however, and are constructed and maintained by collective capital, and use, or service, is considered rather than commercial profit, the tendency is to apply electric power, as is the case in many countries of Europe. Were all the steam railroad lines of the United States to be electrified, it is estimated that one-sixth of the total coal consumption of the country could be saved. Specifically, the 125,000,000 tons of coal now being burned by the railroad lines of the country could be reduced to 40,000,000 tons, were electricity to be adopted as the motive power universally.

There are three methods by which electric railways are operated; by trolley, or overhead wires; by underground conduits; and by the third rail system. The trolley system is usually applied in the surburban districts. A copper wire runs along poles overhead, along which the electric current is transmitted from the power house. A small wheel at the

end of the trolley pole on the car effects the necessary contact, and transmits the current down the pole to the motor underneath the car. The current then strikes the track and thence returns to the power station. The conduit method is employed in crowded cities, where overhead wires would constitute a danger to traffic. Trenches are dug along the streets, as was done with the old cable car system, and steel braces, or girders, shaped somewhat like horseshoes, are set down into the trench every few feet. The sides and top are then covered in with concrete, a slot being left open along the top. Along the bottom of the trench, under the slot, runs the charged rail. A steel pole, with what is called the rubbing block at the end, runs along the slot and maintains contact with the charged rail. By this system the danger to traffic is eliminated. New York City and Washington, D. C., are the two chief cities in which the conduit system is employed. In many cities the old cable car underground trenches, or conduits, are now used in this way. The third-rail system is employed on all elevated railways and subways, where the exposed rail does not endanger the lives of the people. Wherever it is employed the tracks must be carefully guarded against intrusion by the general public, as contact with the third rail is immediately fatal. The third rail runs along a track, beside one of the regular tracks. A shoe, or flat piece of steel, projected from the locomotive, and furnishing contact for the motor, runs smoothly along the track. This makes possible the transmission of a much stronger current than could be attainable by a revolving wheel, such as the wheel at the end of the trolley pole.

On May 31, 1919, it was reported that the vast extension of the electric railway systems of the United States represented an investment of six billion dollars. Exclusive of main trunk lines, there were, in 1920, approximately 50,000 miles of trolley car track in operation in the United States. There are experts who believe that this development has now reached its apex, or has even passed it within the past few years, during the war, for it is a fact that during the recent increase in expense of operation, due to the higher cost of metals and coal, many hundreds of miles of electric railway track in the country have been abandoned, in many cases permanently. In a majority of the cities fares have had to be raised to meet the increased cost of operation. Here, and even in cities where fares have not been raised, the gasoline-driven car is now appearing as a keen competitor of the electric railway. The so-called "jitneys," now a familiar feature of every city street, are cutting deeply into the revenues of the electric railway companies, and that at a point where they are most vulnerable —where the short-haul traffic is thickest. Bus lines require no expensive capitalization; they may, moreover, adapt themselves quickly to sudden and changing needs and they operate with more speed and despatch. Whether they shall, in the near future, check the extension of electric railway systems in the cities and surburban districts rests, probably, on the problem of a cheaper gasoline supply.

In 1920 there were 8,300 miles of heavy trunk lines operating under electric motive power. On these tracks were employed four hundred electric locomotives of twenty different types, the most powerful of which were capable of hauling trains of 1,200 tons along level tracks at the rate of sixty miles an hour.

ELECTRIC TELEGRAPH. See TELEGRAPH.

ELECTRO-CHEMISTRY, that branch of the science in which chemical reactions are brought about by the agency of an electric current. The fact that common salt can be split up into its elements, sodium and chlorine, by passing an electric current through its solution, was discovered in the early years of electrical research, and during the last century the decomposition by electricity of all solutions of salts, acids and bases, and the laws under which that decomposition takes place, have been very thoroughly investigated. It has been discovered that when a solution is electrolyzed, it acts as a conductor, at the same time decomposing in such a manner that the metallic radicle is produced at the negative pole and the acid or hydroxyl radicle at the positive pole. For instance, when an electric current is passed through a solution of common salt, sodium is produced at the kathode and chlorine at the anode. The amount of chemical decomposition brought about is directly proportional to the amount of current passing through the solution. When this method of manufacture is employed on a commercial scale, therefore, it is customary to use a high amperage (or current) and a low voltage (or electromotive force). To obtain these conditions the resistance of the cell must obviously be kept as low as possible, and it has been found that this diminishes with rise in temperature and with increase in strength of the solution. The cell is therefore filled with a hot, concentrated solution and for a similar reason the electrodes are placed as close

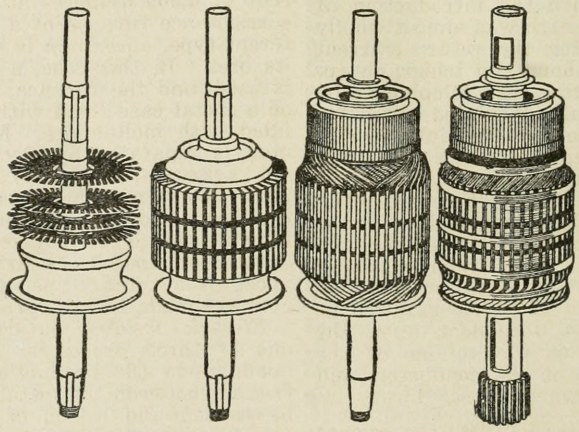
together as conditions permit, and are made large in area.

The most common application of electricity to industrial chemistry is probably in the manufacture of bleach and soda from common-salt. As has been stated, when brine is electrolyzed, sodium and chlorine are produced. Sodium, however, reacts violently with water, and cannot exist, as such, in aqueous solution. As soon as formed, it combines with water to form sodium hydroxide, more familiarly known as caustic soda or lye. Unless special means are taken to prevent the soda and the chlorine from coming in contact with one another, they will combine to form hypochlorite of soda, sometimes called soda bleach. Electric cells to produce this soda bleach are in use to-day in laundries, but they are inefficient and require frequent repairs.

Special types of cells have therefore been designed to prevent the combination of the soda and chlorine, so that the soda can be drawn off, as such, and the chlorine gas collected and combined with lime to form bleaching powder. Of these cells the best known are the Castner-Kellner, the Hargreaves-Bird, the Allen-Moore and the Nelson.

In the Castner-Kellner cell, electrolysis takes place between an anode above and a kathode of mercury below. The chlorine gas rises to the top of the cell and is drawn off, while the sodium combines with the mercury to form sodium amalgam. The latter is decomposed by water to form caustic soda, the mercury being liberated and recovered for further use. The process is made continuous, either by giving the cell a rocking motion, which causes the mercury to flow from one compartment to another, or by means of an Archimedean screw which continually carries away the mercury amalgam, and brings fresh mercury to take its place.

The Hargreaves-Bird, Allen-Moore, and Nelson cells differ in detail rather than in principle. In these cells the chlorine and soda are prevented from reacting with one another by means of a diaphragm, which separates the anode compartment from the kathode. Into the inner, or anode, compartment, flows continuously a concentrated brine solution, and on either side of the compartment is a diaphragm made of an asbestos compound, which becomes saturated with the brine and so permits passage of the current to the kathodes on the outer sides of the diaphragm. The soda produced on the kathodes is washed down by steam which is injected into the outer compartments of the cell. In the Hargreaves-Bird cell, carbon dioxide is also injected into the kathode compartment, so that carbonate, instead of hydroxide of soda is produced. The advantage of the Castner-Kellner cell over the other three is the high purity and concentration of soda produced, but owing to the large amount of mercury required the cost of installation is very high.



FOUR STAGES IN THE MAKING OF THE ARMATURE

The production of *chlorates* is carried out in cells similar in type to those described above, but no diaphragm is used, and the oxidation of the hypochlorite is promoted by the use of potassium chromate. *Oxygen* and *hydrogen* are produced by electrolyzing acidulated water, cells fitted with iron electrodes being commonly employed for this purpose. Other chemical processes in which an electric current is employed are the pro-

duction of ozone, peroxides and sodium, and in the preparation of various organic compounds.

The *fixation* of *atmospheric nitrogen* can be carried out by passing an electric spark through the air. The nitrogen and oxygen of the atmosphere combine, producing oxides of nitrogen, which are dissolved in water, nitric acid being the final product.

In the laboratory, the electric current is used in analysis for determining concentrations, for titration, a galvanometer being used in place of a chemical indicator, and for determining metals quantitatively, by deposition on a platinum electrode, and weighing.

ELECTROLYSIS, the decomposition of chemical compounds by electricity. This word is one of the many that have come into common use since electricity has played so important a part in every-day affairs, and means the condition which causes decomposition of gas and water pipes buried near the wires of electric railroads. As long ago as 1833 it was discovered that the earth could be used as a part of a circuit to carry electric currents, and until the introduction of electric cars the earth was almost wholly depended upon for the return current required by telephone and telegraph apparatus. Now the best telephone circuits have carefully insulated wires for the return current. The interference with the telegraph is much less than with the telephone from this cause. When electricity passes through moist earth it causes the decomposition of the water and the formation of oxygen and hydrogen gases. The oxygen, reaching metallic pipes, causes oxidation and ultimate destruction. The time required is, of course, wholly dependent upon the conditions, such as the volume of the current, the size of the conductor, and the amount of oxygen liberated.

ELECTRO-MAGNETISM, the science which treats of the development of magnetism by voltaic electricity, and the properties or actions of the currents thus evolved. Professor Oersted, of Copenhagen, led the way in the discoveries which established the science; Ampere, Faraday, Barlow, Arago, Nobili and others followed in his track. The temporary magnetic moment is proportional to the intensity of the currents. In the case of an iron bar it is proportional to the number of windings. In a magnet it is proportional also to the square root of the diameter of the magnet. In solid and in hollow cylinders of the same diameter it is equal in amount. The attraction of an armature by an electro-magnet is proportionate to the square of the intensity of the current, as long as the magnetic moment does not attain its maximum. Two unequally strong electro-magnets attract each other with a force proportional to the square of the sums of both currents. For powerful magnets the length of the branches of an electro-magnet is without influence on the weight which it can support.

ELECTRO-METALLURGY. Under this term are included the processes of extracting metals from their ores, purifying them, and dealing with them by such special processes as annealing, welding, plating, etc.

Where electric power is cheap, or where very high temperatures are required, metals are extracted from their ores in the *electric furnace*, and under that heading will be found brief descriptions of the manufacture of graphite, carborundum, and steel by this process. *Calcium carbide* is also made in the electric furnace, a mixture of lime and coke dust being heated to fusion by passing through the mixture an alternating current of 4,000 amperes at 110 volts. In a resistance furnace of a somewhat different type, *aluminum* is extracted from its ores. In this case, a direct current is used, and the furnace, which consists of a metal case lined with aluminum, is filled with molten ore. Metallic aluminum is separated by electrolytic action (*v.* ELECTRO-CHEMISTRY) and accumulates upon an iron or carbon plate at the bottom of the furnace, this plate forming the negative pole. *Magnesium*, *sodium*, and *potassium* are made in furnaces of a smilar type, while *steel* and *zinc* are made in arc furnaces.

Electric welding is carried out by one of three processes. The first depends upon the production of an electric arc between the metallic surfaces to be welded and a rod of carbon. The metal is connected to the positive pole of a generator, and the carbon to the negative pole. The carbon, held in insulated tongs, is brought into contact with the metal and then drawn back a few inches, an arc being thus produced, the heat from which melts the metallic surfaces together. In the second process, the metal is connected to the negative pole, while the positive pole is formed by a lead-lined vat. This vat is filled with dilute sulphuric acid, into which the metal is plunged. Electrolytic action is set up, and the metal becomes covered with bubbles of hydrogen, thus offering powerful resistance to the passage of the current. The metal soon reaches the necessary temperature, when

it can be removed from the bath and welded on the anvil. The third process is known as the incandescent process. The two pieces of metal to be welded are connected to opposite poles of a generator, and then brought together. The resistance offered raises the surfaces to incandescence, when they can be welded.

Electro-plating depends upon the electrolysis of a solution of a metallic salt, and by its means a coating of the metal in solution is deposited upon another metal which forms the electrode of the cell in which the electrolysis takes place. For silver plating a solution of potassium silver cyanide is used; for nickel plating, nickel ammonium sulphate; and for copper plating, a solution of copper sulphate. In all cases the general procedure is the same. The metal to be plated forms the kathode of the cell, and must be perfectly clean and free from all traces of grease. The solution must also be kept moving, either by means of paddles or by moving electrodes. The current required is small, and seldom exceeds 12 amperes per square foot, being, in the case of nickel plating, as low as four amperes per square foot.

Electric refining is a similar process to electro-plating, but in this case the impure metal forms the anode of the cell, the pure metal being first brought into solution and then deposited on the kathode. For instance, in the refining of copper, a solution is made containing about 2 pounds of copper sulphate and 6 ounces of sulphuric acid per gallon of water. This solution forms the electrolyte. The crude copper to be purified forms the anode, while the kathode consists of a graphitized plate of pure copper. When the current is passed, copper is dissolved from the anode and deposited in very pure form upon the kathode.

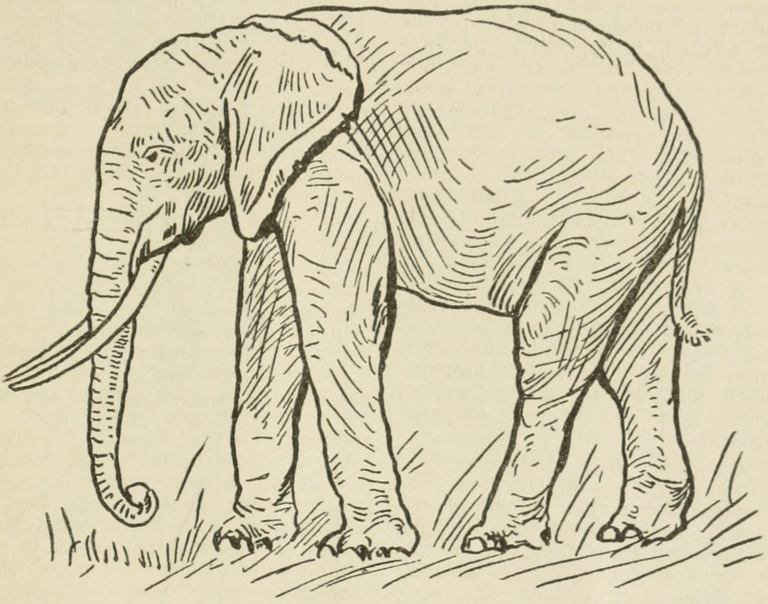
Electro-typing is the process by which reproductions are made of such articles as medals, engraved plates, busts, and so on. A reversed cast is first obtained in the usual manner, wax or gutta-percha being used for the purpose. An impression of the cast is then made in a mixture of bees-wax, Venice turpentine and plumbago, and the surface of this impression is covered with graphite, and carefully cleaned with alcohol and water. It is then submitted to a process very similar to that of electro-plating, a deposit of metal being produced all over the surface of the wax, until a sufficient thickness is obtained. The metal shell, thus formed, is removed from the wax and "backed" with metal —an alloy of lead, antimony, and tin being commonly used. See also ELECTRIC FURNACE, ELECTRO-CHEMISTRY.

ELEMI, gum resins derived from various trees. The American or Brazilian elemi is from *Icica Icicariba*, the Mexican from *Elaphrium elemiferum*, and the Eastern or Manila from *Canarium commune*. In commercial parlance, a brownish yellow resin, from a species of elemi, used to mix with spirit and turpentine varnishes to prevent their cracking as they dry. Distilled with water it yields a transparent colorless oil, which boils at 166°. In pharmaceutical use elemi has an odor like fennel, and a bitter, aromatic taste. It is used to form *Unguentum elemi*, ointment of elemi, which is applied as a topical stimulant.

ELEPHANT, the largest existing land animal. Its ordinary height at the shoulder is about 8 feet, but sometimes exceeds 10 feet. The weight of a large elephant is about five tons, the body being very bulky in proportion to its height. To sustain this weight it is furnished with limbs of colossal thickness and strength, which are also remarkably straight, each bone resting vertically on that beneath it. The flexibility of these limbs is sufficient to permit elephants to run with a speed often greater than that of the best horse. Elephants live in herds, each having a leader who gives the alarm in case of danger and decides what direction to take in escaping from an enemy. When the leader is the special mark for the hunter's attack, because he is the largest and has the finest tusks, the rest of the herd do their utmost to protect him. The elephant is generally one of the most inoffensive of animals, though in a state of domestication it shows a power both of remembering and resenting an injury. The favorite haunts of wild elephants are in the depths of forests—particularly in mountainous regions. Only two existing species of elephants are certainly known, the Indian (*Elephas Indicus*) and the African (*Elephas Africanus*).

The amount of daily food necessary for the elephant in a state of domestication may be stated, on an average, at about 200 pounds in weight. The elephant first became known in Europe from its employment in the wars of the East. Elephants have been taught to cut and thrust with a kind of scimetar carried in the trunk, and it was formerly usual for them to be sent into battle covered with armor and bearing towers on their backs, which contained warriors. But the prineipal use of the elephant in war is for carrying baggage and for

dragging guns. Elephants are used in the East for carrying persons on their backs, a number being seated together in a howdah, while the driver (mahout) sits on the elephant's neck, directing it by his voice and by a small goad. Elephants have always a conspicuous place in the great processions and state displays of Asiatic princes, and white



AFRICAN ELEPHANT

elephants—albinos—are peculiarly valued. Instances are on record of extreme longevity in domestication extending not only to more than 100, but almost to 200 years.

ELEPHANTA, an island over 4 miles in circuit, in the harbor of Bombay, 6 miles E. of the city, and 4 miles from the mainland. It owed its European name to a large figure of an elephant which stood near its former landing-place, but which, after 1814, gradually sank into a shapeless mass. Of the island's far-famed Brahmanic rock-caves, four are complete, or nearly so; the most important is the Great Temple, still used by the Hindus on Sivaite festivals. The word is also used to designate the thunder storm that marks the end of the rainy season in the region around Bombay, India.

ELEPHANT APPLE, a tree that grows in India. It is of the orange tribe, and is large and handsome, with pinnate leaves and a large gray fruit with a very hard rind.

ELEPHANT HAWK-MOTH, an insect with upper wings olive-brown inclining to olive green, with purple-tinged, rose-red markings, a white margin and spot, and a red fringe. Under wings dusky at the base, and reddish-purple posteriorly, with a pure white fringe. The caterpillar feeds on the willowherbs, the vine, etc. The small elephant hawk-moth is one of the smallest species of the genus, being usually but 20 lines long.

ELEPHANTIASIS (-tī'a-sis), a cutaneous disease, especially prevalent in Egypt. It is so called from its likeness to an elephant's hide.

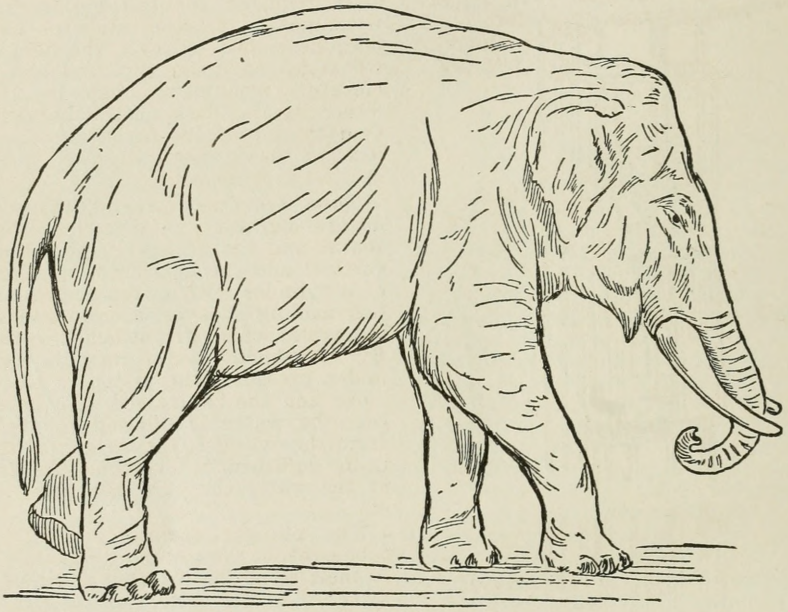
ELEPHANTINE (-tī'nē), a small island of Egypt, in the Nile, opposite Assuan. It is covered with ruins piled on each other—Egyptian, Roman, Saracen, and Arabic, the most important being a gateway of the time of Alexander, a small temple dedicated to Khnum and founded by Amenophis II., and the ancient Nilometer mentioned by Strabo. The island gave the 5th dynasty to Egypt.

ELEPHANT SEAL, the proboscis seal, or sea-elephant, the largest of the seal family. There are probably two species, one found only on the coast of California and western Mexico, the other found in Patagonia, Kerguelen Island, Heard's Island, and other parts of the Southern Seas. They vary in length

from 12 to 30 feet, and in girth at the chest from 8 to 18 feet. The proboscis of the male is about 15 inches long, but elongates under excitement. The females have no proboscis, and are considerably smaller than the male.

ELEPHANT'S EAR, a name sometimes given to plants of the genus *Begonia*.

ELEUSINIAN MYSTERIES, festivals held annually at Eleusis, a town of Attica, in honor of the goddess Demeter. The usual opinion is that they were begun by Eumolpus, the first hierophant, 1356 B. C. Great secrecy was observed in the celebration of the festivals, consisting of the greater and lesser mysteries; and it was a capital offense to reveal any of the rites. They existed about 18 centuries, and ceased during the invasion of Alaric I., in 396.



INDIAN ELEPHANT

ELEUSIS (e-lū'sis), a decayed village of Attica, but in ancient times a city of Greece, 12 miles from Athens. It was celebrated as the chief seat of the worship of Ceres, whose temple here was the largest sacred edifice in Greece.

ELEVATOR, a moving platform or cage in a building, for carrying passengers or freight up and down.

Vitruvius, an architect of Rome about 26 B. C., describes in his writings an apparatus built by Archimedes in the year 236 B. C. for lifting very heavy weights. This, as nearly as can be ascertained, is the first mention in history of an elevating device.

About 1850 platform freight elevators were manufactured by Henry Waterman of New York City and George C. Fox & Company of Boston, Mass.

One of the first instances of a practical elevator installation for carrying passengers was the lift installed in the old Fifth Avenue Hotel at 5th Avenue and 23d Street, New York City. The building was six stories high and the elevator consisted of a cast-iron screw extending the total height of the building. The car was built around the screw, the rotation of which caused the car to move either up or down.

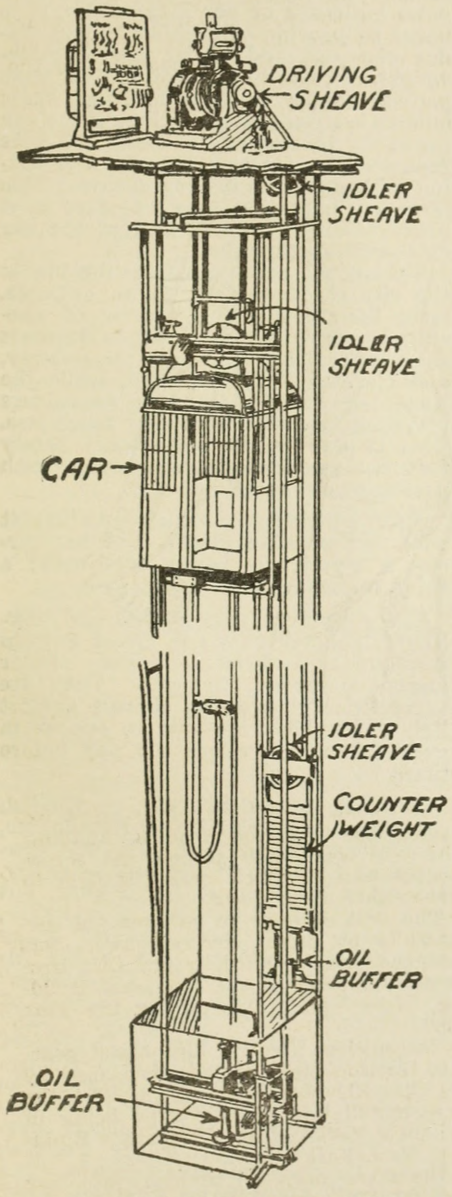
The first elevator to be operated successfully by direct electric power, was designed and installed by the Otis Brothers' Company in the Demarest Building, New York City, during the year 1889.

The modern electric high-speed gearless traction elevator was developed by the Otis Elevator Company, in 1904, the first installation of this type being in the New York Edison Company's Building, New York.

Elevators may be divided into five general classes: electric, hydraulic, steam, belt, and hand power, to which may be added the escalator or moving stairway.

Electric elevators, constituting about 90

per cent. of the installations of the present time, are of two types, namely, those with winding drums and those with traction sheaves. The former type are designed with drums spirally grooved on which the cables wind and unwind in



GEARLESS TRACTION ELEVATOR

raising and lowering the elevator. Elevators of the traction type are provided with straight grooved sheaves over which the cables pass, the friction between the sheave and the cables being utilized for raising and lowering the elevator. Figure 1 shows in diagram the usual arrangement of car, counterbalance cables, etc., for an electric drum machine, while Figure 2 shows a similar arrangement for the traction type electric elevator. The worm-geared drum machine was almost universally used until the advent of the high-speed gearless traction machine which was designed to eliminate the excessive drum sizes required for tall buildings. The worm-geared traction machine has now been developed to cover the field of the worm-geared drum type machine. The elevator machinery may be located either at the base of the hatchway or over the top of the hatchway, the latter location being preferable as it simplifies the arrangement.

There are three principal types of hydraulic elevators: the vertical, the horizontal and the plunger type. Both the vertical and the horizontal types consist of a cylinder with piston rods connected to traveling sheaves, around which pass the cables which are attached to the car. By introducing water into the cylinder under pressure, the piston is caused to move and the car raised. To lower the car, the water is allowed to discharge from the cylinder, the weight of the car being sufficient to overcome the friction of the water through the valves, pipes, etc.

The plunger elevator consists of a tube sunk in the ground a distance equal to the rise of the elevator and a plunger attached to the bottom of the car working in this tube through a stuffing box. Movement of the car is accomplished by water under pressure entering the cylinder, causing the plunger and the car to rise. To lower the car the water is allowed to discharge from the cylinder.

Except in special cases, very few hydraulic elevators are being installed at the present time, the cost of installation and also the cost of operation being much higher than for the electric type of elevator.

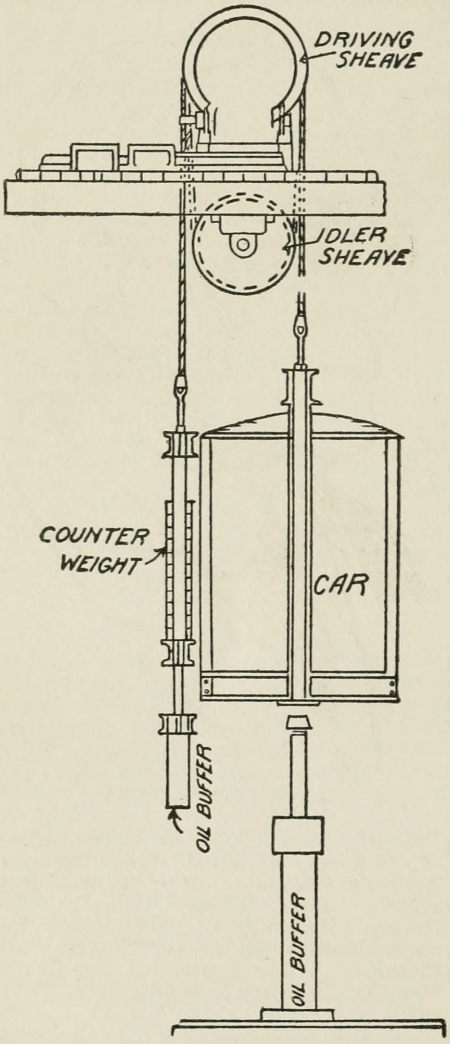
The steam type of elevator consists of a steam engine as the motive power, geared to a winding drum around which the cables to the car pass. This type of elevator is practically obsolete at the present time.

The belt elevator is usually driven from a line shaft and is only used for slow speeds.

The hand power elevator is used only when the service is infrequent and the expense of installing a power-driven elevator is not warranted. It is oper-

ated by pulling an endless rope over a driving sheave which is geared to the winding machine.

Safety features of elevator.—With the exception of the plunger type of elevator, practically all elevators are provided with what is known as a Safety Device, designed to grip the guide rails and stop



ROPING FOR GEARLESS TRACTION ELEVATOR

the car if for any reason the speed of the elevator becomes excessive or if, due to the breaking of the lifting cables, the car starts to fall. Additional safeties are provided to automatically stop the car at the upper and lower terminal landings in case the operator neglects to do so, and if the car runs by these landings, to cut off the supply of current, apply the brake, and bring the car to rest.

In connection with high-speed traction elevators, the gearless type of which is used for passenger service in the modern office buildings of our large cities, it is usual to provide oil-cushion buffers under the car and under the counterweight. If, due to accident, the car runs past the upper or lower landings, these buffers are compressed, bringing the car gradually to rest and at the same time reducing the traction between the lifting cables and the driving sheave. This is a very important safety feature as it prevents any further travel of the car or the counter-weight.

Taking the borough of Manhattan in the city of New York as an example, more than double the number of passengers are carried vertically in elevators than are carried by the surface, subway, and elevated lines combined, while the percentage of accidents to passengers traveling in elevators is very much less. This is due to the exceptional safety features provided in connection with passenger elevators.

ELF, a little sprite supposed to inhabit wild and desolate places, and to exercise a mysterious power over man; a fairy, a goblin.

ELF ARROWS, ELF BOLTS, and **ELF-SHOT**, popular names in Great Britain for stone arrow-heads, and other similar ancient barbarian weapons. They are superstitiously worn as charms against lightning. They are said to appear in great quantities where the day before there were none.

ELGAR, SIR EDWARD, an English composer. He was born at Broadheath, Worcestershire, in 1857, and was educated at Littleton House and privately. He acted as organist for a time, but soon engaged in musical composition, and since 1896 has produced many musical publications. His works include: "King Olaf," "Caractacus," "Variations," "Sea-pictures," "Dream of Gerontius," "The Coronation Ode." "Gerontius" was produced in Düsseldorf in 1901, and repeated at the Niederrheinische Musik-Fest in 1902. "The Apostles" was produced at the Birmingham Festival in 1903; the concert overture, "In the South," Elgar Festival, Covent Garden, 1904; the oratorio, "The Kingdom," Birmingham Festival, 1906. "The Apostles" was also produced in German at the Niederrheinische Musik-Fest in Cologne, 1904. Other of his works include: Symphonies, violin con-

certo; "The Coronation March" (1911); "Masque, The Crown of India" (1912). Elgar received many distinctions, including the Order of Merit; Associate, Académie des Beaux-Arts, Belgium; Hon. Academician, Royal Swedish Academy, Stockholm; Hon. Member Société des Compositeurs, Paris; Member Maatschaapij tot Bevordering der Toonkunst, Holland.

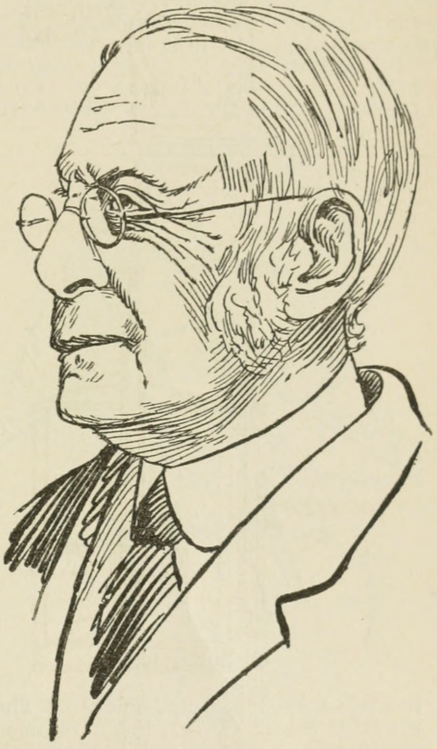
ELGIN, a city in Kane co., Ill., on both sides of the Fox river; at the junction of the Chicago and Northwestern, and the Chicago and Pacific railroads; 36 miles W. of Chicago. The river at this point is spanned by a handsome iron bridge and affords excellent water power. Elgin is noted for its varied and extensive manufactures, and contains the Elgin Watch Works, the Borden milk condensing works, butter and cheese factories, boiler works, bicycle and sewing machine works, shoe, silver plated goods, and lumber factories. It has the Elgin Academy public high school, St. Mary's Academy, Illinois Northern Hospital for the Insane. Gail Borden Free Library, several parks, electric lights and street railways, waterworks, 4 National and several savings banks, daily and weekly newspapers. Pop. (1910) 25,976; (1920) 27,431.

ELGINSHIRE, MORAYSHIRE, or MURRAYSHIRE, a county of Scotland, in the N. E. part, with an area of 475.75 square miles. In the S. are high mountains. The soil is fertile in the N. part, and agriculture is an important industry. There are also salmon and salt-water fisheries. The chief industry of the county is the distilling of whiskey. Pop., about 45,000. The principal town is Elgin.

ELIAS, SAINT, a lofty mountain on the N. W. coast of America. It rises about 18,000 feet above the sea, being visible to mariners at a distance of 50 leagues. Physically, it marks pretty nearly the point where the shore, after trending in a N. W. drection, turns due W.; politically it divides itself between the Territory of Alaska and the Dominion of Canada.

ELIJAH, the most distinguished of the prophets of Israel, flourished in the 9th century B. C., during the reigns of Ahab and Ahaziah, and until the beginning of the reign of Jehoram, his special function being to denounce vengeance on the kings of Israel for their apostasy. He incurred the anger of Jezebel, wife of Ahab, for slaying the prophets of Baal, but escaped to Horeb, afterward returning to Samaria to denounce Ahab for the murder of Naboth. Elijah at length ascended to heaven in a chariot of fire, Elisha his successor, being witness. See I Kings xvii. to xxi. and II Kings i. and ii.

ELIOT, CHARLES WILLIAM, American educator and author; born in Boston, Mass., March 20, 1834; president of Harvard University (1869-1909). President

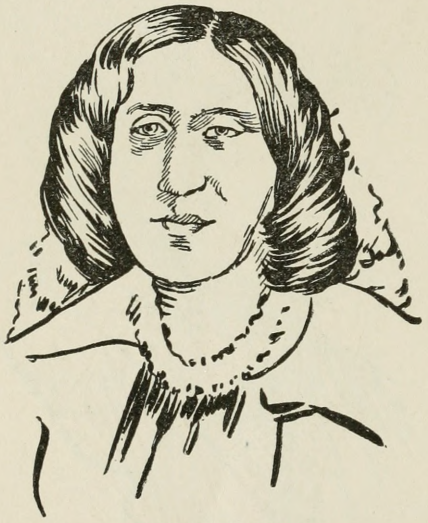


DR. CHARLES W. ELIOT

Emeritus since 1909. He is the author of "Manual of Qualitative Chemical Analysis"; "Manual of Inorganic Chemistry"; "John Gilley" (1904); "The Happy Life" (1905); "The Road Towards Peace." He edited "The Harvard Classics," better known as the "Five-Foot-Shelf Library." (Collier, New York, 1910).

ELIOT, GEORGE, the pen name of MARY ANN or MARIAN EVANS, an English novelist; born near Nuneaton, Nov. 22, 1820. She received at Coventry an excellent education, and shortly after her 21st year became a convert to Rationalism. Her first literary undertaking was the completion of Mrs. Hennell's translation of Strauss' "Life of Jesus" (1846). After spending two years abroad she became subeditor of the

"Westminster Review." In January, 1857, she came prominently into public notice with a series of tales entitled "Scenes from Clerical Life." In the following year the publication of "Adam Bede" placed her in the first rank of writers of fiction. It was succeeded by the "Mill on the Floss" (1860); "Silas Marner" (1861); "Romola" (1863); "Felix Holt" (1866); "Middlemarch" (1872), and "Daniel Deronda" (1876). She published also three volumes of verse, "The Spanish Gypsy" (1868); "Agatha" (1869), and the "Legend of Jubal" (1874). Her last work published during



GEORGE ELIOT

her life was "The Impressions of Theophrastus Such" (1879), but a volume of mixed essays was issued posthumously. For many years she was happily associated in life and work with George Henry Lewes, though a legal union was impossible during the lifetime of Mrs. Lewes. In May, 1880, after Mr. Lewes' death, she married Mr. John Cross, but did not survive the marriage many months, dying rather suddenly at Chelsea on Dec. 22 of that year.

ELIOT, JOHN, "the Indian Apostle"; born probably at Widford in Hertfordshire, in 1604. He graduated at Cambridge in 1622, and, after taking orders in the Church of England, emigrated to Boston, Mass., in 1631. In 1646, after two years' study of the language, he delivered a long sermon in the native dialect at Nonantum; other meetings soon followed. He shortly after began to establish his converts in regular settlements, his work meeting with approval both in the colony and at home; in England a corporation was founded in 1649 "for the promoting and propagating the Gospel among the Indians of New England." In 1674 the number of "praying Indians" was estimated at 3,600; but the decay of the "praying towns" was rapid after the war with a native king, Philip (1675), in which the converts suffered equal cruelties at the hands of their countrymen and of the English. With Thomas Weld and Richard Mather, Eliot prepared the "Bay Psalm-book" (1640), the first book printed in New England. His great work was the translation of the Bible into the tongue of the Indians of Massachusetts (Algonquin) (1661-1663). He died in Roxbury, Mass., May 21, 1690. There are monuments to his memory in the Indian burying ground at South Natick and at Newton.

ELIOT, SAMUEL, an American educator and historian; born in Boston, Mass., Dec. 22, 1821. He filled the chair of history and political science in Trinity College, Hartford, Conn. (1856-1864); was president of Trinity College (1860-1864); and overseer of Harvard (1866-1872). Among his publications are: "The History of Liberty" (1853); "The Liberty of Rome" (1849); "Life and Times of Savonarola" (1856); "Manual of United States History Between the Years 1492 and 1850" (revised ed., 1873); and "Stories from the Arabian Nights" (1879). He died in Beverly, Mass., Sept. 14, 1898.

ELIS, a maritime state of ancient Greece in the W. of the Peloponnesus, bordering on Achaia, Arcadia, and Messenia, and watered by the rivers Alpheus and Peneus. Of its capital Elis (now Kaloskopi) there are few traces. Olympia, where the famous games were held, was near the Alpheus. Elis and Achaia now form a monarchy of Greece.

ELISHA, a Hebrew prophet, the disciple and successor of Elijah. Many miracles of prediction and cure, and even of raising the dead, are ascribed to him. He held the office of prophet for fully 65 years, from the reign of Ahab to that of Joash (latter half of 9th century B. C.).

ELIZABETH, a city and county-seat of Union co., N. J., on Staten Island Sound and on the Pennsylvania, Lehigh Valley, Baltimore and Ohio, Philadelphia and Reading and New Jersey Central railroads, 14 miles S. W. of New York City. It covers a wide expanse of level land, is laid out with broad and handsome streets, running at right angles, has numerous business blocks, and is noted for the large number of handsome residences of New York business men. The chief articles manufactured are

sewing machines, oilcloth, hats, saws, mill machinery, stoves, hardware, edge tools, harness, cordage, and combs. A large business is done in the shipment of anthracite coal. The Crescent Steel Works and Shipyard, in which many naval vessels have been built, are located here. Among public institutions are the Alexian Brothers' Hospital, General Hospital, Orphan Asylum, Home for Aged Women, and Public Library. The educational institutions include the Battin and Pingry High Schools, and a business college. The city has electric lights and street railways, many old and handsome churches, a National and several private banks, building and loan associations, etc. Elizabeth has considerable historical interest. It was settled as Elizabethtown in 1665, and was the capital of New Jersey from 1755 to 1757. It contains an old tavern where Washington stopped on his way to New York for his first inauguration, Gen. Winfield Scott's home, the Boudinot House, and the Livingston Mansion. Pop. (1910) 73,409; (1920) 95,-682.

ELIZABETH, Queen of England, daughter of Henry VIII. and of Anne Boleyn; born in Greenwich, Sept. 7, 1533. On Nov. 17, 1558, at the close of the reign of her sister, Mary, Elizabeth was recognized queen by Parliament. The accuracy of her judgment showed itself in her choice of advisers. The first object of her reign was the settlement of religion, to effect which a parliament was called Jan. 25, and dissolved on May 8, its object having been accomplished. Freed from the tyranny of Mary's reign, the Puritans began to claim predominance for their own dogmas, while the supporters of the Established Church were unwilling to grant them even liberty of worship. The Puritans, therefore, like the Catholics, were made irreconcilable enemies of the existing order, and increasingly stringent measures were adopted against them. But the struggle against the Catholics was the most severe, chiefly because they were supported by foreign powers. Many Catholics, particularly priests, suffered death during this reign. Elizabeth's first parliament requested her to marry, but she declared her intention to live and die a virgin; and she consistently declined in the course of her life Duc d'Alençon, Prince Erik of Sweden, the Archduke Charles of Austria, and Philip of Spain. With the unfortunate Mary, Queen of Scots, were connected many of the political events of Elizabeth's reign. The detention of Mary in England (1568-1587), whither she fled to the protection of Elizabeth, led to a series of conspiracies, which finally determined Elizabeth to make away with her captive. The execution of Queen Mary (1587), though it has stained her name to posterity, tended to confirm her power among her contemporaries. But Philip of Spain was not to be appeased, the execution of Mary lending edge to other grievances. He called Elizabeth a murderess, and refused to be satisfied even with the sacrifice she seemed prepared to make of her Dutch allies. The Armada sailed May



ELIZABETH, QUEEN OF ENGLAND

29, 1588. Its fate is well known. The war with Spain dragged on till the close of Elizabeth's reign. During her reign the splendor of her government was sustained by such men as Burleigh, Bacon, Walsingham, and Throgmorton; but she had personal favorites of less merit who were often more brilliantly rewarded. Chief of these were Dudley, whom she created Earl of Leicester, and whom she was disposed to marry, and Essex, whose violent passions brought about his ruin. He was beheaded in 1601, but Elizabeth never forgave herself his death. Her own health soon after gave way, and she died March 24, 1603.

ELIZABETH, Queen of Bohemia; born in Scotland, Aug. 19, 1596. She forms the connecting link between the ancient royal families of England and

Scotland and the present reigning dynasty. Daughter of James VI. of Scotland and I. of England, she married in 1613 Frederick V., Elector Palatine, who in 1619 was chosen King of Bohemia. Through her daughter Sophia, Electress of Hanover, she became the grandmother of George I. of Great Britain. She died in England, Feb. 13, 1662.

ELIZABETH, Queen of Rumania. See CARMEN SYLVA.

ELIZABETH, the wife of Zacharias and mother of John the Baptist. An angel foretold to her husband the birth of a son to her old age; and it was also foretold by the angel Gabriel to the Virgin Mary, as an assurance of the birth of the Messiah.

ELIZABETH CITY, a city of North Carolina, the county-seat of Pasquotank co. It is on the Norfolk and Southern and the Virginia and Carolina Coast railroads and on the Pasquotank river. It has an important trade in cotton, lumber, and oysters. Its industries include saw mills, shingle factories, cotton and hosiery mills, flour mills, iron works, shipbuilding yards, brick works, carriage factories, etc. Pop. (1910) 8,412; (1920) 8,925.

ELIZABETH FARNESE (far-nā'se), Queen of Spain, daughter of Edward II., Prince of Parma; born in 1692. On becoming the second wife of Philip V. she surprised those who had counseled the marriage by assuming the practical headship of the kingdom; her ambition and that of her minister, Alberoni, disturbed the whole of Europe. She died in 1766.

ELIZABETHGRAD, a town of southern Russia, on the Ingul, with an imperial palace, a theater, manufactures of soap, candles, etc., and several great fairs.

ELIZABETH ISLANDS, a group of 16 American islands S. of Cape Cod, with a permanent population of about 100.

ELIZABETH OF VALOIS (va-lwä'), or **ISABELLA**, Queen of Spain; born in 1545, daughter of Henry II. of France and Catherine de Medici. She was destined to be the wife of the infante, Don Carlos, but his father, Philip II., being left a widower, became fascinated and married her himself. The story of a romantic relationship between Elizabeth and Don Carlos has furnished tragic subjects to Otway, Campistron, Chénier, Schiller, and Alfieri. She died in 1568.

ELIZABETH PETROVNA, Empress of Russia; born in 1709. She was daughter of Peter the Great. In 1741 she usurped the imperial throne, by dethroning the infant Ivan. At her accession, she made a vow that no capital punishment should take place in her reign. But she afterward inflicted on the Countesses Bestuchef and Lapoukin the punishment of the knout, and had their tongues cut out for betraying some of her secret amours. Though dissolute in her manners, she was extremely superstitious, and performed her devotions with rigorous exactness. In 1756 she joined Austria and France against Prussia. She died in 1762.

ELIZABETH, SAINT, daughter of Andreas II., King of Hungary; born in Pressburg, in 1207. She early displayed a passion for the severities of the Christian life, despising pomp, ambition, and exhibiting the most self-denying benevolence. When only 14 years old, she married the Landgrave of Thuringia, Louis IV., who died in 1227. Great misfortunes soon befell her. She was deprived of her regency by the brother of her deceased husband, and driven out of her dominion on the plea that she wasted the treasures of the state by her charities. The inhabitants of Marburg, whose miseries she had frequently relieved, refused her an asylum, for fear of the new regent. At last she found refuge in the monastery of Kitzingen, and when the warriors who had attended her husband in the Crusade returned from the East, she gathered them around her, and recounted her sufferings. Steps were taken to restore to her her sovereign rights. She declined the regency, however, and would accept only the revenues which accrued to her as landgravine. The remainder of her days were devoted to incessant devotions, almsgivings, mortifications, etc. She died Nov. 19, 1231, and was canonized four years later.

ELKHART, a city in Elkhart co., Ind., at the confluence of the St. Joseph and Elkhart rivers and on the Big Four, the Lake Shore, and St. Joseph Valley, Chicago, South Bend and Northern Indiana railroads, 101 miles E. of Chicago. It is a railroad center and shipping point for a large agricultural region. The rivers afford excellent water power. A large dam and power house were erected in 1913. The Lake Shore railroad shops are located here and the manufacturing interests include brass, carriage, starch, machinery, gas generators, rubber and paper. Elkhart is the seat of Elkhart Institute, and has public schools, business colleges, and high school, daily and weekly newspapers, gas and electric lights, electric railways, water works, and a National bank. Pop. (1910) 19,282; (1920) 24,277.

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